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臺灣省農業試驗所圖書館藏書

Aphididæ of Formosa.—2.

By

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Introduction.

Since the publication of the former paper, "Aphididæ of Formosa.—1," in which ninety-eight species are recorded, the following new forms have been collected in our island:

Macrosiphum	*cirsicola* n. sp.
M.	*debilis* n. sp.
M.	*ambrosiæ* (Thomas).
M.	*taiwanum* n. sp.
Neophorodon	*rubi* Takah.
Myzus	*tropicalis* n. sp.
M.	*momonis* Mats?
M.	*formosanus* n. sp.
M.	*menthæ* (Buckt).
M.	*bœhmeriæ* n. sp.
Capitophorus	*hippophæs* (Koch).
Amphorophora	*formosana* n. sp.
A.	*sonchifoliæ* n. sp.
Aphis	*nerii* Boyer.
A.	*malvoides* van der Goot?
A.	*lilii* Licht?
A.	*species.*
A.	*species.*
Cerosipha	*species.*
Cryptosiphum	*artemisiæ* Buckt.
Eutrichosiphum	*minutum* n. sp.

A list of the Formosan Aphididæ.

Family **Aphididæ.**

Subfamily **Aphidinæ.**

Tribe **Aphidina** (syn. *Siphonophorina* v. d. Goot).

Subtribe **Macrosiphini.**

1. Genus *Macrosiphum.*
   - *M. gobonis* Mats.
   - *M. formosanus* Takah.
   - *M. rosæ* (L.)
   - *M. pisi* (Kalt.)
   - *M. cirsicola* n. sp.
   - *M. smilacifoliæ* Takah.
   - *M. pæderiæ* Takah.
   - *M. debilis* n. sp.
   - *M. ambrosiæ* Thomas.
   - *M. taiwanum* n. sp.
   - *M. granarium* (Kirby).
     syn. *M. miscanthi* Takah.
   - *M. alopecuri* Takah.
   - *M. neoartemisiæ* Takah.
2. Genus *Macrosiphoniella.*
   - *M. citricola* v. d. Goot.
   - *M. tanacetarium* (Koch).
   - *M. sanborni* (Gillette).
   - *M. formosartemisiæ* Takah.
3. Genus *Myzus.*
   - *M. woodwardiæ* Takah.
   - *M. polypodicola* Takah.
   - *M. persicæ* (Sulz.)
   - *M. hemerocallis* Takah.
   - *M. arthraxonis* Takah.
   - *M. formosanus* n. sp.

Dilachnus	*piniformosanus* n. sp.
Dilachnus	*sp.*
Eulachnus	*rileyi* (Will.)?
Oregma	*orientalis* n. sp.
O.	*montana* v. d. Goot.
Astegopteryx	*fici* n. sp.
A.	*styracophila* Kars.
Forda	*species.*

The winged or wingless forms of *Macrosiphum pæderiæ* Takah., *Fullawayella formosana* Takah., *Cavariella araliæ* Takah., *Cavariella neocaprææ* Takah., etc. and the sexuales of *Callipterus kahawaluokalani* (Kirk.) and *Myzus persicæ* (Sulz.) were unknown when my first paper was written, but they all have been collected since that time.

In the present paper, I will describe these Formosan, and some new or little-known Japanese, Aphididæ, and will also set forth the results of my field observations on these insects which have been carried on during the past six years in Japan, as well as in Formosa, adding some notes on the aphidicolous ants, and concluding with a food plant catalogue of the Formosan Aphididæ.

The results of further studies will be published later. The types of the new species dealt with in the present paper are preserved in the collection of the entomological loboratory of the Department of Agriculture, Government Research Institute, Formosa. All the drawings accompanying this paper were made by the author.

The author wishes to express his sincere thanks to Dr. T. SHIRAKI, Chie of the Section of Economic Zoology of this Department, for his kindness in conducting these investigations. The author must also tender his grateful thanks to Dr. C. P. ALEXANDER of the University of Illinois, who has kindly read up the manuscript of this paper to correct the errors in English.

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(The word "immediate" on the pages 75 and 78 of the former paper, Aphididæ of Formosa—1, is a lapsus of "intermediate.")

M. tropicalis n. sp.
M. momonis Mats?
M. menthæ (Buckt.)

4. Genus *Capitophorus.*
C. formosartemisiæ Takah.
C. hippophæs (Koch)

5. Genus *Trichosiphonaphis.*
T. polygoniformosanus Takah.

6. Genus *Neophorodon.*
N. rubi Takah.

7. Genus *Phorodon.*
P. humuli (L.)

8. Genus *Amphorophora*
A. indicum (v. d. Goot.)
A. oleraceæ (v. d. Goot)
A. sonchifoliæ n. sp.
A. formosana n. sp.
A. species.

Subtribe **Pentalonini.**

9. Genus *Pentalonia.*
P. nigronervosa Coq.

10. Genus *Fullawayella.*
F. formosana Takah.
F. violæ. (Perg.)

Subtribe **Vesiculaphidini.**

11. Genus *Vesiculaphis.*
V. caricis (Full.)

Subtribe **Aphidini.**

12. Genus *Rhopalosiphum.*
syn. *Yamataphis.*
R. pseudobrassicæ (Davis)
R. nymphaeæ (L.)
R. lahorensis (Das)
R. avenæ (Fab.)

syn. *Rhopalosiphum papaveris* Takah.
Yamataphis papaveris Takah.
Toxoptera rufiabdominalis Sasaki.
Yamataphis oryzae Mats.

13. Genus *Cavariella.*
C. bicaudata (Essig et Kuw.)
C. neocaprœ. Takah.
C. araliæ Takah.

14. Genus *Brevicoryne.*
B. brassicæ (L.)

15. Genus *Toxoptera.*
T. aurantii (Boyer.)
T. leonuri Takah.

16. Genus *Aphis.*
A. gossypii Glove.
A. gossypii Glove. var. *callicarpæ* Takah.
A. malvae Koch.
A. medicaginis Koch.
A. rumicis L.
A. saliceti Kalt.
A. pomi De Geer.
A. tavaresi Del Guer.
A. malvoides v. d. Goot?
A. nerii Boyer.
A. lilii Licht?
A. kurosawai Takah.
A. nasturtii Koch?
A. droserœ Takah.
A. miscanthi Takah.
A. formosanus Takah.
A. shirakii Takah.
A. maidis Fitch.
A. ficicola Takah.
A. somei Essig et Kuw.

M. querciformosanus Takah.

M. bambusifoliæ Takah.

27. Genus *Callipterus.*

C. kahawaluokalani (Kirk.)

Subtribe **Phyllaphidini.**

28. Genus. *Shivaphis.*

S. celti Das.

Subtribe **Saltusaphidini.**

29. Genus *Phyllaphoides.*

P. bambusicola Takah.

Subtribe **Neophyllaphidini.**

30. Genus *Necphyllaphis.*

N. podocarpi Takah.

Subtribe **Chaitophorini.**

31. Genus *Periphyllus.*

P. formosanus Takah.

Tribe **Lachnina.**

Subtribe **Lachnini.**

32. Genus *Lachnus.*

L. thujafoliæ (Theob.)

33. Genus *Dilachnus.*

D. piniformosanus n. sp.

D. sp.

34. Genus *Tuberolachnus.*

T. viminalis (Fons.)

Subtribe **Eulachnini.**

35. Genus *Eulachnus.*

E. piniformosanus Takah.

E. rileyi Williams?

Subtribe **Ancœcini.**

36. Genus *Aiceona.*

A. actinodaphnii Takah.

Tribe **Hormaphidina.**

Subtribe **Oregmini.**

A. bambuscæ Full.

A. smilacifoliæ Takah.

17. Genus *Anuraphis.*

A. helichrysi (Kalt.)

18. *Hyalopterus.*

H. prumi (Fab.)

19. Genus *Brachycolus.*

B. heraculei Takah.

20. Genus *Brachysiphoniella.*

B. gramini Takah.

21. Genus *Cerosipha.*

C. sp.

22. Genus *Cryptosiphum.*

C. artemisiæ. Buckt.

Tribe **Greenideina.**

Subtribe **Greenideini.**

23. Genus *Greenidea.*

G. quercifoliæ Takah.

G. formosana (Maki)

G. nigra (Maki)

G. nigrafasciata (Maki)

G. ficicola Takah.

G. taiwana Takah.

24. Genus *Eutrichosiphum.*

E. lithocarpi (Maki)

E. minutum n. sp.

Subtribe **Cervaphidini.**

25. Genus *Cervaphis*

C. quercus Takah.

Tribe **Callipterina.**

Subtribe **Callipterini.**

26. Genus *Myzocallis.*

M. bambusicola Takah.

M. pseudoalni Takah.

37. Genus *Oregma.*
    - *O. bambusicola* Takah.
    - *O. bambusifoliæ* Takah.
    - *O. panicola* Takah.
    - *O. lanigera* (Zehnt.)
    - *O. orientalis* n. sp.
    - *O. montana* v. d. Goot.

38. Genus *Cerataphis.*
    - *C. latanicæ* (Boisd.)

Subtribe **Hormaphidini.**

39. Genus *Aleurodaphis.*
    - *A. blumeæ* v. d. Goot.

40. Genus *Astegopteryx.*
    - *A. quercicola.* Takah.
    - *A. giganteum* Takah.
    - *A. fici* n. sp.
    - *A. styracophila* Karsch.
    - *A. styracicola* Takah.

Tribe **Pemphigina.**

Subtribe **Melaphidini.**

41. Genus *Nurudea.*
    - *N. shiraii* (Mats.)

Subtribe **Fordini.**

42. Genus *Forda.*
    - *F. sp.*

43. Genus *Geoica.*
    - *G. lucifuga* (v. d. Goot.)

44. Genus *Paracletus.*
    - *P. cynodonti* (Das)

Subtribe **Eriosomatini.**

45. Genus *Tetraneura.*
    - *T. javensis* v. d. Goot.

Subtribe **Pemphigini.**

46. Genus *Dryopeia.*

D. hirsuta Baker.

Subfamily *Chermesinæ.*

47. Genus *Chermes?*
    - *C.? sp.?, attacking Pinus.*

Descriptions of new or little-known Formosan Aphididae.

Macrosiphum cirsicola n. sp.

(Pl. II, B, figs. 4—5)

Wingless viviparous female.

Yellow or greenish yellow. Eyes dark reddish brown. Antennæ pale brown, with the apices of the 3rd and 4th joints, and the 5th and 6th dusky. Cornicles pale green, with black apices. Cauda pale yellowish green. Legs pale brown, apices of femora and tibiæ, and tarsi black.

Body with a few short bristles. Head with some moderately long somewhat knobbed setæ. Frontal tubercles developed, somewhat convex on the inner side. Antennæ very long and slender, with some very short slightly knobbed setæ; the 3rd joint provided with about 9 mostly small circular sensoria distributed almost in a single row on the basal half; the 4th slightly imbricated, lacking sensoria; the relative length of joints as follows: III—173, IV—124, V—102, VI—28 + ? 200. Rostrum reaching the middle coxæ. Cornicles cylindrical, very long and slender, slightly dilated at the base, imbricated throughout, without any reticulations, almost as long as the 4th antennal joint, about 1. 7 times as long as the cauda, to which it attains midlength. Cauda ensiform, wider than the cornicle, with 3 pairs of lateral bristles. Legs very long and slender, provided with many rather long normal setæ; tarsi not very long.

Length of body—about 3.5mm. Antenna—about 5.0 mm.
Cornicle—0.9 mm.

Winged viviparous female.

Green. Head very slightly pale brownish. Eyes dark brown. Antennæ almost black. Mesothorax pale brown. Abdomen with some dark green patches on the dorsum. Cornicles pale brown, with black apices. Cauda pale green. Legs pale brown, distal halves of femora, apices of tibiæ, and tarsi black. Wings along the 1st and 2nd obliques very narrowly fuscous clouded; veins almost gray; stigma pale gray.

Antennæ very long and slender, almost without hairs; the 3rd joint provided with about 30 rather small, somewhat protruding circular sensoria arranged almost in a row over nearly the whole length; the 4th somewhat imbricated, lacking sensoria; the relative length of joints about as follows: III—147, IV—107, V—81, VI—28 + ? Abdominal segments provided with many short setæ arranged in a transverse row. Cornicles cylindrical, very long and slender, imbricated, a little reticulated at the tip, somewhat dilated at the base, a little more than twice as long as the cauda, and a little shorter than the 4th antennal joint. Cauda ensiform, provided with 3 pairs of long lateral bristles and an apical one. The 1st and 2nd obliques on the fore wing rather stout. Legs very long and slender, provided with many rather long normal setæ; tarsi rather short.

Length of body—about 2.5 mm. Cornicle—about 0.6 mm.

Host.—*Cirsium japonicum.*

Distribution—Formosa: Taihoku; Japan: Tokyo.

Macrosiphum debilis n. sp.

(Pl. IV, A, figs. 2—4)

Wingless viviparous female.

Dirty green, somewhat pinkish. Eyes red. The 3rd and 4th antennal joints pale brown, which black apices; the 5th and 6th black. Cornicles black. Cauda green, slightly dusky. Legs pale brown, with the apices of femora and tibiæ, and tarsi black. Body with some rather short stout setæ which are somewhat knobbed. Frontal tubercles not convex on the inner side.

Antennæ slender, with some short capitate hairs, the 3rd joint provided with 8—11 small circular sensoria not arranged in a row on the basal half; the 4th somewhat imbricated, lacking sensoria; the relative length of joints as follows: III—65, IV—55, V—44, VI—74 (17 + 57). Rostrum reaching the middle coxæ. Cornicles cylindrical, stout, dilated at the base, tapering, imbricated, reticulated almost on the distal half, about 4 times as long as wide, almost reaching the base of the cauda, almost as long as or a little longer than the 4th antennal joint. Cauda ensiform, a little shorter than the cornicle, with 3 pairs of long lateral bristles. Legs long and slender, with many

apices black; tarsi black. Body with many rather long, very stout normal bristles. Head with some longer bristles. Frontal tubercles moderately developed, not convex on the inner side. Antennæ slender, with some rather long stout bristles, some of which are slightly knobbed; the 1st joint much larger than the 2nd; the 3rd provided with about 20 small circular sensoria scattered over the basal half; the 4th somewhat imbricated, lacking sensoria; the relative length of joints as follows: III—100, IV—53, V—50, VI—135 (20+115). Rostrum reaching the hind coxæ. Cornicles cylindrical, large, stout, dilated at the base, imbricated, reticulated on the distal one-fifth, about 4.5 times as long as wide, a little shorter than the 3rd antennal joint, about 2.2 times as long as the cauda, almost reaching the caudal apex. Cauda large, rather stout, with many long bristles. Legs slender, provided with many rather long stout bristles.

Length of body—2.5 mm. Antenna—2.7 mm.

Cornicle—0.7 mm.

Host.—Gnaphalium multiceps.

Distribution.—Formosa: Kwanshirei.

North America.

Collected by the author in March, 1921.

Hitherto unrecorded from Formosa.

Macrosiphum rosæ L.?

(Pl. II, B, figs. 2—3)

Wingless viviparous female.

Green. Antennæ yellowish brown, apices of the 3rd, 4th and 5th joints, and the 6th black. Eyes and cornicles black. Cauda yellow. Legs yellowish brown, apical halves of femora and tibiæ, and tarsi black.

Body as in *Macrosiphum rosæ L.* in general appearance, provided with some short stout setæ. Head provided with some longer setæ. Frontal tubercles large, somewhat convex on the inner side, where 4 setæ are present. Antennæ long and slender, with some moderately long setæ; the 1st joint very large, slightly angulated on the inner side; the 3rd not imbricated, provided with 4—7 small circular sensoria almost in a single row near the base; the

moderately long setæ, some of which are knobbed.

Length of body—2.6 mm. Antenna—2.6 mm.

Cornicle—0.55 mm.

Winged viviparous female.

Dirty green. Head reddish brown. Eyes red. Antennæ black, with the base of the 3rd joint paler. Thorax dark greenish brown. Cornicles black. Cauda almost dirty yellowish brown. Wings hyaline; stigma pale greenish; veins gray. Legs pale yellowish brown, apical halves of femora, apices of tibiæ, and tarsi black. Body with some short, slightly knobbed hairs. Head with some similar longer hairs. Frontal tubercles well developed, not convex on the inner side. Antennæ long and slender, with some short capitate hairs; the 3rd joint provided with about 20 circular sensoria mostly of medium size, almost over the whole length not in one row; the 4th striated, lacking sensoria; the relative length of joints as follows: III—96, IV—78, V—66, VI—142 (26+116). Rostrum almost reaching the middle coxæ. Wings normal; hind wings with 2 parallel obliques; hooklets 4. Cornicles cylindrical, moderately dilated at the base, imbricated, reticulated on the distal two-fifths, a little longer than the cauda, almost as long as the 4th antennal joint. Cauda ensiform, almost twice as long as the hind tarsi, with 4 pairs of lateral bristles. Legs very long and slender, with numerous setæ; tarsi very long, imbricated.

Length of body—2.4 mm. Antenna—2.7 mm.

Fore wing—3.2 mm. Cornicle—0.5 mm.

Host.—*Lactuca debilis.*

Distribution.—Formasa: Taihoku.

Macrosiphum ambrosiæ (Thomas)

Siphonophora ambrosiæ, Thomas, Illinois Lab. Nat. Hist., Bull 2, p. 4 (1878); Honda, Biol. Bull. XL, 6, p. 356 (1921).

Wingless viviparous female.

Shining black. Antennae, eyes and cornicles black. Cauda brownish black. Legs: femora black, with the bases brown; tibiæ brown, with the

4th slightly imbricated at the tip, without sensoria; ths 5th imbricated; the relative length of joints as follows: III—144, IV—116, V—100, VI—27+155.

Rostrum reaching the middle coxæ. Cornicles cylindrical, very long and slender, broadest at the base, gradually tapering, imbricated, a little reticulated at the tip, 6.5 times as long as wide, about twice as long as the cauda.

Cauda large, ensiform, with 3 pairs of lateral bristles. Legs long and slender, with numerous moderately long setæ, tarsi normal.

Length of body—3.5 mm. Cornicle—0.9 mm.

Antenna—4.1 mm.

Host.—*Rubus sp*, attacking the young shoots and leaves.

Distribution.—Formosa (Kwanshirei).

Macrosiphum granarium (Kirby)

(Pl. VIII, A, figs 6—8)

Macrosiphum miscanthi, Takahashi, Aphididæ of Formosa—1, p. 8 (1921).

Wingless viviparous female.

(Described from specimens on *Miscanthus sp.*)

Dirty yellowish brown, somewhat pinkish. Eyes dark brown. Antennæ and cornicles black. Abdomen black on the dorsum. Cauda pale yellowish brown. Femora mostly black, with the bases pale; tibiæ pale brown, with black apices; tarsi black. Some individuals dirty pale green, pinkish; slightly dusky on the dorsum of the abdomen.

Body elongately ovate. Head provided with about 8 moderately long stout bristles which are slightly capitated on the dorsal surface. Frontal tubercles moderately developed, slightly convex on the inner side. Antennæ very long and slender, provided with some moderately long setae which are slightly capitated; the 3rd joint scarcely imbricated, provided with 1—3 small circular sensoria near the base; the 4th imbricated, lacking sensoria; the relative length of joints as follows: III—145, IV—120, V—90, VI—27+140? Rostrum reaching the middle coxæ. Thorax and abdomen provided with some rather short hairs which are slightly capitated on the dorsum. Cornicles long and slender, cylindrical, somewhat expanded toward the base, slightly narrowed near the apex in some specimens, imbricated, reticulated on the apical one

fifth, almost as long as the 3rd antennal joint, about 1.7 times as long as the cauda. Cauda long, ensiform, provided with 3 or 4 pairs of lateral and an apical bristles. Legs very long and slender, provided with many moderately long setæ which are scarcely capitated.

Length of body—about 2.5 mm. Antenna—about 2.8 mm.

Cornicle—about 0.7 mm.

Host,—*Miscanthus sp.*, attacking the flower.

Distribution.—Formosa: Taihoku.

Some wingless viviparous females were observed in the first week of December, 1922.

This species is closely related to *Macrosiphum smilacifoliæ* Takah. (Aphididæ of Formosa—1, p. 12), but differs from it in the cauda which is more stouter, as well as in the colour of the body.

Macrosiphum pæderiæ Takah.

(Pl. II, A, fig, 11 & Pl. V, A, figs. 1—3)

Aphididæ of Formosa—1. p, 11, pl. II. 2. figs 1—5 (1921).

Winged viviparous female.

Colour almost as in the wingless form. Wings hyaline. Head with some long bristles. Frontal tubercles large, slightly convex on the inner side.

Antennæ very long and slender, with a few very short hairs; the 1st joint very large and very slightly convex on the inner side; the 3rd provided with 7—8 circular sensoria of medium size arranged in a row mostly on the basal half; the 4th slightly striate, lacking sensoria; the relative length of joints as follows: III—83, IV—69, V—68, VI—150 (24+126). Rostrum reaching the middle coxæ. Abdomen provided with some shorter bristles. Cornicles cylindrical, somewhat shout, almost as long as the 5th antennal joint, scarcely dilated at the base, slightly narrowed on the apical portion, not imbricated, with the apices roughly reticulated, almost 6.5 times as long as wide. Wing-veins normal. Legs long and slender, with many bristles.

Length of body—1.8 mm. Antenna—about 3.0 mm.

Cornicle—about 0.5 mm.

The winged form was not known previously.

Macrosiphum taiwanum n. sp.

(Pl. 1, B. figs. 1—4)

Wingless viviparous female.

White. Eyes black. Antennæ white; apices of the 3rd and 4th joints, apical half of the 5th, and the 6th black. Cornicles white, with black apices Cauda white.

Fore femora white, with black apices, posterior two pairs of femora mostly black; tibiæ white, with black apices; tarsi black. Body with peculiar black or blackish brown markings on the dorsum as shown in the figure.

Body oval, without hairs. Head with a few very short capitate hairs. Frontal tubercles large, slightly convex on the inner side. Antennæ very long and slender, much longer than the body; the 1st joint somewhat angulated on the inner side; the 2nd much shorter than the 1st; the 3rd not imbricated, with a circular sensoria of medium or rather small size near the base; the 4th slightly imbricated; the relative length of joints as follows: III—90, IV—64, V—63, VI—130 (26+104). Rostrum reaching the hind legs.

Body lacking lateral tubercles. Cornicles cylindrical, very long and slender, as long as the 4th antennal joint, reaching near the caudal apex, scarcely dilated on the middle or base, scarcely imbricated, except the tip, almost twice as long as the cauda. Cauda very large and stout, gradually tapering, with the apex rounded, with a slight constriction about midlength, provided with 2 pairs of long lateral bristles. Legs very long and slender, with some short setæ.

Legth of body—about 2.3 mm. Antenna—2.7 mm.

Cornicle—0.45 mm.

Host.—unknown.

Distribution.—Formosa (Kwanshirei).

Genus **Neophorodon** Takah.

Proc. Entom. Soc. Washington, 24, p. 204 (1922).

(Wingless form). Body provided with many capitate hairs. Frontal tubercles large, without projections on the mesal face. Antennæ 6—jointed; spur longer than the base; the 1st joint with a blunt tubercle on the inner

side. Lateral and dorsal tubercles absent. Cornicles long, gradually swollen on the distal half. Cauda shorter than the cornicle, stout, longer than wide, broadest at the base, tapering. Tarsi normal.

(Winged form). Body without capitate hairs. Frontal tubercles very short. Antennæ with circular sensoria; the 1st joint with a small tubercle. Wing-veins normal.

Type—*Neophorodon rubi* Takah.

This genus is closely allied to *Phorodon* Pass. and *Mutsumuraja* Schum (syn. *Acanthaphis* Mats.), but differs from the former in lacking projections on the frontal tubercles, and from the latter in having no tubercles on the dorsum of the abdomen. *Neophorodon* is also allied to *Akkaia* Takah., but it is distinguished from the latter by the 6-jointed antennæ, the lack of projections on the frontal tubercles, the smaller anal plate, etc.

Neophorodon rubi Takah.

(Pl. 1, B, figs. 5—8).

Proc. Entom. Soc. Washington, 24, p. 204 (1922).

Wingless viviparous female.

Pale yellow. Eyes black. Antennæ mostly black. Cornicles pale brown, with the apices black. Cauda yellow. Legs pale brown, apices of tibiæ, and tarsi black. Body oblong, provided with many rather long capitate hairs. Frontal tubercles very large, almost as long as the 2nd antennal joint, lacking projections, very slightly convex and provided with 2 capitate hairs on the inner side. Antennæ provided with a few short capitate hairs; the 1st joint much larger than the 2nd, on the inner side with a broad, blunt tubercle which does not attain the apex of the 2nd joint, provided with 2 capitate hairs; the 2nd lacking projections; the 3rd slightly imbricated, lacking sensoria; the 4th imbricated; the relative length of joints as follows: III—33, IV—22, V—21, VI—61 (15+46). Rostrum reaching the minddle coxæ. Cornicles long, equal in length to the last antennal joint, almost reaching the base of the cauda, scarcely imbricated, somewhat swollen on the distal half, expanded at the base, broadest at the base, about 4.2 times as long as wide and about 4 times as long as the cauda. Cauda short, stout, triangular when seen from

above, longer than wide, with the apex rounded, provided with 2 pairs of moderately long lateral bristles. Legs slender, with many capitate hairs; hind tarsi a little shorter than the cauda.

Length of body—2.2 mm. Antenna.—1.3 mm.

Cornicle—0.4 mm.

Winged viviparous female.

Yellowish brown. Head, antennæ and thorax black. Abdomen with the middle of the dorsum somewhat dusky. Cornicles slightly dusky. Cauda yellow. Wings hyaline; stigma gray; veins dark brown. Legs yellowish brown; apice of tibiæ slightly dusky; tarsi blackish. (Described from specimens preserved in alcohol). Body without hairs; head with some short bristles. Frotal tubercles very short, somewhat projecting on the inner side.

Antennæ laking hairs, the 1st joint larger than the 2nd, with a short, blunt tubercle on the inner side; the 3rd not imbricated, provided with 27 large, oval sensoria scattered over the whole length; the 4th somewhat imbricated, provided with 14 large, circular or oval sensoria scattered over the whole length; the 5th provided with 5 large sensoria in a row along the whole length, the apical sensorium large and oval; the relative length of joints as follows: III—49, IV—29, V—26, VI—67 (15+52). Rostrum reaching the middle coxæ. Subcosta with 7 small sensoria on the distal two-thirds; the 2nd branch of the 3rd oblique rather short; hind wings with 2 almost parallel obliques; hooklets 3. Cornicles nearly similar to those of the wingless form, moderately swollen on the distal two-thirds, expanded at the base, 5 times as long as wide, scarcely imbricated, as long as the spur of the last antennal joint and almost 4 times as long as the cauda. Cauda triangular when seen from above, almost as long as wide, as long as the hind tarsi, with 2 pairs of lateral bristles. Legs slender, with many bristles.

Length of body—2.25 mm. Antenna—1.5 mm.

Fore wing—3.4 mm. Cornicle—0.37 mm.

Host.—*Rubus sp.* (*R. fraxinifolius?*).

Distribution.—Formosa: Kagi.

Trichosiphonaphis Takah.

Proc. Entom. Soc. Washigton, 24, p. 405 (1922).

Wingless form.

Body broad, with some short capitate hairs. Frontal tubercles large, with a short, blunt tubercle on the inner side. Antennæ 6-jointed; spur longer than the base; the 1st joint slightly convex on the inner side. Lateral and dorsal tubercles absent. Cornicles cylindrical, slightly swollen near the apex, provided with some prominent capitate hairs. Cauda large, longer than wide, shorter than the cornicle, somewhat constricted at the base. Tarsi normal.

Winged form.

Body without capitate hairs. Frontal tubercles very short, slightly convex on the inner side. Antennæ 6-jointed; sensoria circular. The 3rd oblique twice forked; hind wings with only one oblique. Cornicles cylindrical, slightly swollen near the apex, provided with some prominent bristles which are not capitate. Cauda short and stout.

Type.—*Myzus polygoniformosanum* Takah.

This genus differs from *Myzus* Pass. in the following points:

1. Hind wings with only one oblique.
2. Cornicles provided with normal or capitate hairs.

Trichosiphonaphis polygoniformosanus Takah.

(Pl. III, B, figs. 2—4)

Winged viviparous female.

Body lacking hairs. Head with a few normal hairs. Frontal tubercles very short, somewhat convex on the inner side. Antennæ imbricated, lacking hairs; the 1st joint scarcely convex on the inner side; the 3rd provided with about 45 very small, circular sensoria scattered over the whole length; the 4th with 18 very small sensoria; the 5th with about 8 sensoria almost in a row, the apical sensoria larger; the relative length of joints as follows: III —61, IV—37, V—32, VI—91 (13+78). Rostrum reaching the d dle coxæ.

Fore wings with the 3rd oblique twice forked; subcosta provided with about 10 small circular sensoria on the distal half; stigmatic vein not strongly curved; hind wings with only one oblique; hooklets 4; wing veins rather stout. Cornicles cylindrical, imbricated, very slighted dilated on the basal and distal portions, 2.5 times as long as the cauda, reaching almost the caudal base, 6 times as long as wide, with some moderately long bristles.

Cauda short and stout, widened on the basal half, longer than wide, with 2 pairs of lateral bristles near the apex.

Legs long and slender, with many setæ; tarsi rather slender; hind tarsi as long as the cauda.

Length of body—about 1.8 mm. Antennæ—about 1.8 mm.

Cornicle—0.3 mm. Fore wing—2.5 mm.

This winged female, which was hitherto unknown, was collected in March 1921 at Kagi.

Host.—*Polygonum perfoliatus*.

An aphis feeding on *Lonicera japonica* seems to be identical with this species.

Wingless viviparous female (Pl. II, A, figs. 8—9)

(on *Lonicera japonica*)

Dark brown, blackish brown or black. Head somewhat yellowish. Eyes dark brown. Antennæ pale yellowish brown, apex of the 5th joint, and the 6th dusky. Cauda yellowish brown. Cornicles yellowish brown, with black apices. Legs pale yellowish brown; apices of tibiæ, and tarsi dusky. Body oval, provided with a few very short capitate hairs. Head provided with a few rather long normal bristles. Frontal tubercles conspicuous, with a small blunt tubercle on the inner side, provided with 2—3 short capitate hairs. Eyes protruding. Antennæ imbricated, with a few very short capitate hairs; the 1st joint somewhat convex on the inner side; the 3rd lacking sensoria; the relative length of joints as follows: III—52, IV—32, V—32, VI—74 (10+64). Rostrum reaching a little beyond the hind coxæ. Body without dorsal and lateral tubercles. Cornicles very long, almost as long as the 6th antennal joint, reaching far beyond the apex of the cauda, imbricated, prominently dilated at the base, almost 6 times as long as wide, slightly dilated near the tip, 3 times as long as the cauda, provided with some prominent long

capitate hairs, which are mostly on the basal half. Cauda large, much longer than the hind tarsi, almost 1.6 times as long as wide, somewhat constricted close to the base, with the apex rounded, provided with 5 pairs of lateral bristles. Legs long, provided with many rather long bristles; tarsi rather slender.

Length of body—1.4 mm. Antenna—1.7 mm.

Cornicle—0.5 mm.

Described from the specimens from Formosa.

Host.—*Lonicera japonica*

Distribution.—Formosa: Taihoku.

Japan: Tokyo.

The Formosan specimens somewhat differ from the Japanese ones in the longer cornicle.

Myzus persicæ (Sulz).

(Pl. VII, A, figs. 1 & 3)

Winged male.

Head, eyes, antennæ, and mesothorax bleck. Abdomen dark green. Femora mostly black; tibiæ pale brown, with black apices; tarsi black. Wing-veins dark brown; stigma rather pale brown. Cornicles pale greenish. Cauda blackish? Frontal tubercles almost as in the winged viviparous female. Antennæ very long and slender, without hairs; the 3rd joint provided with about 50 rather small circular sensoria scattered over the whole length; the 4th somewhat imbricated, provided with about 22 very small sensoria over the whole length, not arranged in a row; the 5th provided with about 22 similar sensoria; the relative length of joints as follows: III—62, IV—52, V—47, VI—105 (21+84). Rostrum reaching the middle coxæ as in the winged viviparous female. Wings not differing from those of the viviparous form. Cornicles very slightly shorter than the 5th antennal joint, almost 3 times as long as the cauda, rather similar in shape to those of the viviparous form. Cauda stout, much shorter than that of the winged viviparous form.

Length of body—about 1.4 mm: Antenna—2.2 mm.

Fore wing—2.65 mm.

Three males were collected in a colony on *Solanum melongena* on March 21, 1922, near Taihoku. No oviparous females have been found.

Myzus formosanus n. sp.

(Pl. VII, A, figs. 4—5).

Wingless viviparous female.

Dark brown. Eyes blackish brown. Antennæ pale brown, apex of the 4th joint, and the 5th and 6th black. Cornicles and cauda almost black, somewhat brownish. Legs pale brown, tarsi somewhat dusky. Body oval, slightly narrowed. Head provided with some rather short hairs which are not knobbed. Frontal tubercles distinct, moderately convex on the inner side.

Antennæ imbricated, provided with a few very small hairs; the 3rd joint lacking sensoria; the relative length of joints as follows: III—36, IV—22, V—18, VI—57 (11+46). Rostrum reaching the middle coxæ.

Lateral or dorsal tubercles absent. Abdominal segments provided with some rather short normal bristles arranged in a transverse row on the dorsum. Cornicles rather short and stout, imbricated, not reticulated, broadest at the base, somewhat tapering, sometimes very slightly curved, shorter than the 3rd, but a little longer than the 4th antennal joint. Cauda not stout, almost as long as the 5th antennal joint, broadest at the base and tapering when seen from above, with 2 slight constrictions, provided with 2 or 3 pairs of lateral bristles. Legs moderately long, provided with some rather short setæ; tarsi rather short.

Length of body—about 1.8 mm, Antenna—about 1.0 mm.

Cornicle—0.2 mm. Cauda—0.12 mm.

Host.—*Polygonum chinensis*.

Distribution.—Formasa: Taihoku.

Myzus menthæ (Buckton).

(Pl. VIII, B, figs. 1—6)

Siphonophora menthæ, Buckton, Monog. British Aphid. 1, p. 120, pl. IX, fig. 1—2 (1875).

Phorodon menthæ, van der Goot, Kenntnis Holland Blattl, p. 134 (1915).

Wingless viviparous female.

Dark green. Head pale greenish. Eyes black, somewhat brownish.

Antennæ pale brownish, slightly dusky on the distal half. Cornicles slightly pale brownish, slightly dusky at the apex. Cauda pale greenish. Legs pale brownish, tarsi slightly dusky.

Body oval, with the dorsal surface irregularly reticulated. Head provided with a few very short stout hairs which are somewhat capitated. Frontal tubercles well developed. Antennæ long and slender, imbricated, with a few very short hairs which are slightly capitated; the 1st joint somewhat convex on the inner side; the 3rd joint lacking sensoria; the relative length of joints as follows: III—65, IV—50, V—50, VI—102 (20+82). Rostrum reaching the hind coxæ. Cornicles cylindrical, somewhat dilated towards the base, very slightly curved, imbricated, almost as long as or a little shorter than the 3rd antennal joint, about 2.7 times as long as the cauda, about 3.5 times as long as wide.

Cauda broadest at the base, about 1.5 times as long as wide, much longer than the hind tarsi, provided with 3 pairs of long lateral bristles.

Abdomen provided with some very short setæ on the dorsum. Legs long and slender, provided with some setæ.

Length of body—about 1.1 mm. Antenna—about 1.5 mm.

Cornicle—about 0.3 mm.

Winged viviparous female.

Green. Head brownish. Eyes almost blackish brown. Antennæ black, very slightly pale just at the base of the 3rd joint. Mesothorax dusky. Cornicles pale green, slightly dusky at the apex. Cauda pale green. Legs pale brown; distal halves of femora, apices of tibiæ, and tarsi black. Wings hyaline; stigma pale dusky; veins dark brown.

Body oblong. Head provided with a few very short hairs. Frontal tubercles moderately convex on the inner side. Antennæ long and slender, imbricated, almost lacking hairs; the 1st joint somewhat convex on the inner side; the 3rd joint provided with about 25—30 small circular sensoria scattered over the whole length, the 4th with about 10—13 similar sensoria, the 5th with about 3—5 sensoria arranged almost in a single row; the relative length of joints about as follows: III—70..78, IV—51, V—50, VI—112 (22—90). Rostrum reaching the hind coxæ. Subcosta of the fore wing provided with 3 or 4 small sensoria; veins rather stout; the 1st oblique not curved; the 2nd very

slightly curved; the 3rd twice forked, extending to the wing apex; hind wings with 2 obliques which are almost parallel; hooklets 2. Abdomen provided with a few very short hairs. Cornicles cylindrical, moderately expanded at the base, somewhat imbricated, almost as long as the 4th antennal joint, a little more than twice as long as the cauda. Cauda with 3 pairs of moderately long bristles. Legs very long and slender, provided with many moderately long setae.

Length of body—about 1.2 mm. Antenna—about 1.5 mm.

Host.—*Mentha arvensis* L. var. *vulgaris* Benth.

Distribution.—Formosa: Taihoku. Europe.

Many winged and wingless viviparous females were collected by the author on October 24, 1922.

Hitherto unrecorded from Formosa.

Myzus tropicalis n. sp.

(Pl. II, A, figs. 6—7).

Wingless viviparous female.

Yellowish green or yellow. Eyes black. Antennæ yellow, apices of the 3rd, 4th and 5th joints, and the 6th black, Cornicles yellow, apical halves black. Cauda yellow.

Legs yellow; apices of tibiæ very slightly dusky; tarsi black. Body provided with a few rather short, stout bristles which are not capitate. Head provided with some longer similar bristles. Frontal tubercles moderately developed, prominently convex on the inner side. Antennæ imbricated, with some setæ; the 1st joint slightly convex on the inner side, the 3rd lacking sensoria; the relative length of joints as follows: III—53, IV—30, V—27, VI—85 (13+72). Rostrum reaching the middle coxæ. Body lacking dorsal tubercles. Cornicles cylindrical, long, almost twice as long as the 4th antennal joint, reaching the base of the cauda, imbricated, broadest at the base, 6.5 times as long as wide, gradually tapering, about 2.8 times as long as the cauda. Cauda broadest at the base, tapering, almost 1.5 times as long as wide, with 3 pairs of lateral bristles. Legs provided with many rather long setæ.

Length of body—2.1 mm. Antenna—1.6 mm.

Cornicle—0.46 mm.

Winged viviparous female.

Yellowish brown. Head, eyes, antennæ, pronotum and mesothorax black. Wings hyaline; stigma and veins gray.

Abdomen with some dusky bands and patches on the dorsum.

Cornicles black. Cauda brownish. Legs brown, apical halves of femora, apices of tibiæ, and tarsi black.

Frontal tubercles very short, somewhat convex on the inner side, with some short bristles. Antennæ imbricated, with a few short bristles; the 1st joint slightly convex on the inner side; the 3rd provided with 13—14 rather large, circular sensoria over the whole length not arranged in a row; the 4th lacking sensoria; the relative length of joints as follows: III—61, IV—45, V—37, VI—97 (13+84). Rostrum reaching the middle coxæ. Prothorax with a blunt lateral tubercle. Wing veins normal; obliques on the hind wing parallel; hooklets 4. Cornicles cylindrical, slender, as long as the 5th antennal joint, almost reaching the base of the cauda, imbricated, not reticulated, gradually tapering, 2.7 times as long as the cauda. Cauda 1.5 times as long as wide, with 3 pairs of lateral bristles.

Length of body—1.7 mm. Cornicle—2.5 mm.

Antenna—1.8 mm.

Host.—*Prunus persica.*

Distribution.—Formosa: Sozan.

Myzus momonis Mats?

(Pl. V, B, figs, 7—14)

Matsumura, Journ. Coll. Agr. Sapporo, VII, pt. 6, p. 402 (1917).

Wingless viviparous female.

Blackish brown, somewhat tinged with yellow. Eyes and cornicles black. Antennæ yellowish brown, with the apical half dusky, Cauda brown. Legs yellowish brown. Body without hairs. Frontal tubercles moderately convex on the inner side. Antennæ short, stout, imbricated, without hairs; the 3rd joint lacking sensoria; the relative length of joints as follows: III—31, IV—14, V—9, VI—34 (9+25). Rostrum reaching the middle coxæ. Body lacking tubercles. Cornicles rather short, imbricated, cylindrical, slightly

expanded at the base, somewhat slightly curved, as long as the spur of the last antennal joint or the 3rd antennal joint, almost twice as long as the cauda. Cauda short and broad, tapering, with a slight constriction near the tip, provided with some bristles. Legs provided with some moderately long bristles; tarsi rather short.

Length of body—1.6 mm. Antenna—about 0.7 mm.

Winged viviparous female.

Frontal tubercles short, somewhat convex on the inner side. Antennæ imbricated, laking hairs; the 3rd joint provided with about 36 large circular or oval sensoria scattered over the whole length; the 4th with 7 similar sensoria not in a row over the whole length; the 5th with a sensorium near the large apical sensorium; the relative length of joints as follows: III—50, IV—21, V—13, VI—53 (11+42). Rostrum reaching the middle coxæ. Cornicles similar to those of the wingless form, a little longer than the 4th antennal joint. The 3rd oblique only once forked (this is perhaps abnormal; hind wings with 2 divergent obliques; hooklets 3.

Length of body—1.5 mm. Antenna—1.35 mm.

Host.—*Prunus persica.*

Distribution.—Formosa: Toyen (Kappanzan)

Japan: Sapporo.

Hitherto unrecorded from Formosa.

Myzus bœhmeriæ n. sp.

(Pl. VIII, A, figs. 1—5).

Wingless viviparous female.

White. Eyes black. Antennæ white, apices of joints slightly dusky. Cornicles and cauda white. Legs white, apices of tibiæ slightly dusky, tarsi dusky. Body oval. Head provided with a few moderately long bristles which are not knobbed. Frontal tubercles well developed, convex on the inner side. Antennæ long and slender, imbricated, almost lacking hairs; the 3rd joint lacking sensoria; the relative length of joints about as follows: III—103, IV—85, V—64, VI—148 (28+120). Rostrum reaching beyond the middle coxæ.

Abdomen almost lacking hairs. Cornicles long and slender, imbricated, cylindrical, slightly expanded toward the base, a little shorter than the 4th antennal joint, almost twice as long as the cauda. Cauda large, stout, stouter than the cornicle, more than twice as long as wide, with two pairs of bristles. Legs long and slender, tibiæ provided with many moderately long setæ mostly on the distal half; hind tarsi a little shorter than the base of the 6th antennal joint.

Length of body—about 1.7 mm. Antennæ—about 2.0 mm.

Cornicle—about 0.38 mm.

Winged viviparous female.

Pale yellow. Head, antennæ and mesothorax black. Eyes blackish brown. Pronotum dusky. Wings hyaline, stigma and veins almost gray. Abdomen with a large black patch on the dorsum, about 4 black patches on the side, and many black patches also on the dorsum. Cornicles blackish. Cauda yellow, very slightly dusky. Femora yellow, with black apices; tibiæ blackish brown, with black apices; tarsi black.

Body oblong. Head provided with some moderately long bristles. Frontal tubercles moderately convex on the inner side. Antennæ long and slender, almost lacking hairs; the 3rd joint somewhat imbricated, provided with about 10 large, circular sensoria arranged in a row almost over the whole length except the distal part; the 4th imbricated, provided with 0—1 sensorium; the relative length of joints as follows: III—97, IV—85, V—67, VI—147 (27+120). Rostrum reaching the middle coxæ. Abdomen provided with a few moderately long bristles on the dorsum.

Cornicles cylindrical, imbricated, scarcely dilated at the base, almost as long as or a little shorter than the 5th antennal joint. Fore wings: veins normal; subcosta with 2—3 small sensoria on the distal half; hind wings with 2 parallel obliques; hooklets 3 or 4. Legs long and slender, provided with many moderately long setæ. Cauda almost half as long as the cornicle.

Length of body—about 1.7 mm. Antenna—about 2.0 mm.

Cornicle—about 0.3 mm. Fore wing—about 2.7 mm.

Host.—*Bœhmeria nivea.*

Distribution.—Formosa: Urai.

A few specimens were collected on the lower surface of the leaves on December 3, 1922.

Myzus woodwardiæ Takah.

Aphididæ of Formosa, pt. 1, p. 20 (1921).

Wingless viviparous female.

Orange. Eyes dark red. Frontal tubercles blackish. Antennæ pale yellow, apices of the 3rd and 4th joints, apical half of the 5th, and the 1st, 2nd and 6th black. Pro-and mesonotum brownish. Metanotum and dorsum of each of the abdominal segments with about 8 small brown spots arranged transversely, of which the middle and lateral ones are largest. Cornicles deep black. Cauda almost black. Legs pale yellow, apical halves of femora, apices of tibiæ, and tarsi black.

I have formerly described the cauda of the wingless form as yellow in colour by mistake, and now corrected this as above.

Capitophorus hippohæs (Koch)

Rhopalosiphum hippophœs, Koch, Die Pflanzl. p. 28, figs 36—37 (1857).

Capitophorus galeopsidis, van der Goot, Tijdschr. voor Entom. LVI, p. 84 (1913).

Capitophorus hippophœs, van der Goot, Kenntnis Holland. Blattl. p. 122 (1915) and Contrib. Fauna. Ind. Neerland 1, iii, p. 46 (1917).

Wingless viviparous female.

Pale yellowish green, sometimes dark green. Eyes dark red. Antennæ pale brown, almost colourless at the base of the 3rd joint. Cornicles and cauda pale green. Legs pale or almost colourless; tibiæ slightly pale brownish at the apices; tarsi dusky. Body rather narrow, soft.

Head provided with 2 pairs of rather long capitate hairs between the frontal tubercles, behind which are a pair of very small similar ones, and with 4 very short ones in a transverse row between the eyes.

Frontal tubercles large, almost as long as the 2nd antennal joint, somewhat convex on the inner side which is provided with 2 very long capitate hairs. Eyes not large. Antennæ very long and slender, imbricated, lacking

hairs; the 1st joint much larger than the 2nd, well developed and provided with 2 very short capitate hairs on the inner side, the 3rd lacking sensoria; the relative length of joints as follows: III—60, IV—48, V—40, VI—139. (17+122). Mesothorax provided with some rather long capitate hairs in groups on each side. Abdomen provided with 6 very short capitate hairs in a transverse row on the dorsum of each of some of the basal segments and a few longer ones on the distal segments. Rostrum almost reaching the middle coxæ. Cornicles very long and slender, a little shorter than the antennal spur, reaching a little beyond the caudal apex, somewhat imbricated, very slightly dilated near the apex, slightly broadened toward the base, almost twice as long as the 4th antennal joint and about thrice as long as the cauda. Cauda much wider than cornicle, provided with 3 pairs of long lateral bristles. Legs long and slender, tibiæ provided with many moderately long capitate hairs.

Length of body—2.3 mm. Antenna—2.25 mm.
Cornicle—0.75 mm.

Winged viviparous female.

Pale yellowish green. Head and pronotum slightly dusky. Mesothorax dusky. Eyes dark red. Antennæ dusky, slightly paler at the immediate base of the 3rd joint. Wings hyaline; stigma pale gray; veins gray. Cornicles almost colorless except the apices which are lightly dusky. Abdomen with a large square green patch on the dorsum between the cornicles. Cauda pale green. Legs pale brown, apices of tibiæ, and tarsi dusky. Body almost lacking hairs. Frontal tubercles short, somewhat developed on the inner side. Antennæ almost lacking hairs; the 3rd joint provided with 35—40, the 4th 24, the 5th 7+1 circular sensoria of medium or small size scattered over the whole length; the relative length of joints as follows: III—50, IV—35, V—33, VI—121 (16+105). Rostrum almost reaching the middle coxæ. Cornicles long and slender, somewhat imbricated, somewhat dilated on the apical portion and at the base, a little longer than the 3rd antennal joint, not reaching the apex of the cauda, almost 2.5 times as long as the cauda. Cauda with a constriction about the middle, provided with 3 pairs of lateral hairs. Abdomen provided with a few very short hairs on the distal half. Fore wings with

the veins normal; hind wings with the obliques parallel; hooklets 3.

Length of body—about 1.7 mm. Antenna—2.0 mm.

Fore wing—2.6 mm. Cornicle— ? mm.

Host.—*Polygonum lapathifolium*, attacking the under surface of the leaf.

Distribution.—Formoso: Taihoku; Java (v. d. G.); Europe.

Hitherto unrecorded from Formosa. Collected by Mr. Sueta.

Since this paper was set up *Capitophorus braggi* (Gillette) has been collected at Taihoku, which will be described in the "Aphididae of Formosa —3."

Amphorophora formosana n. sp.

(Pl. I, B, figs. 9—11)

Wingless viviparous female.

Green. Head yellowish brown. Antennæ and cornicles black. Cauda yellow. Legs yellowish brown, apices of femora and tibiæ dusky; tarsi black. Body oval, with some rather long bristles. Frontal tubercles large, very slightly convex on the inner side. Antennæ long and slender, with some moderately long stout hairs; the 1st joint very large; the 3rd with a rather small, circular sensorium near the base; the 4th somewhat imbricated, lacking sensoria; the relative length of joints as follows: III—113, IV—83, V—67, VI—126 (23+103). Rostrum reaching beyond the base of the middle legs. Body lacking lateral tubercles. Cornicles large, reaching the base of the cauda, not distinctly imbricated except at the tip, distinctly swollen at midlength on one side, slightly expanded at the base, narrowest at the apex, a little shorter than the antennal spur, about 2 times as long as the cauda, about 6 times as long as wide.

Cauda large, stout, ensiform, with 2 pairs of lateral bristles. Legs long and slender, with many rather long setæ.

Length of body—2.7 mm. Antenna—3.4 mm.

Cornicle—0.7 mm.

Host.—Unknown.

Distribution.—Formosa: Kagi.

This species differs from *A. lactucæ* (Kalt.) in the colour of the cornicle.

Amphorophora sonchifoliæ n. sp,

(Pl. I, A, fig. 11, & Pl. II, A, fig. 4)

Wingless viviparous female.

White or pale greenish. Eyes black. Cornicles white or pale greenish, with the apical halves slightly dusky. Cauda white. Legs white, apices of tibiæ, and tarsi black. Body oval, without prominent hairs. Frontal tubercles moderately developed. Antennæ long and slender, without hairs; the 3rd joint provided with 25—30 rather small circular senoria of various sizes, not in a row over the whole length; the 4th imbricated, provided with 3—4 sensoria in a row on the basal half; the 5th with an apical sensorium; the relative length of joints as follows: III—84, IV—52, V—56, VI—133 (23+110). Rostrum short, not reaching the middle coxæ. Cornicles very long and slender, shorter than the 3rd antennal joint, reaching to midlength of the cauda, very slightly swollen on the distal half, slightly dilated at the base, not imbricated nor reticulated, about 7 times as long as wide and about 1.7 times as long as the cauad. Cauda wider than the cornicle, with 3 pairs of lateral bristles. Legs long, with short setæ.

Length of body—2.5 mm. Antenna—2.8 mm.

Cornicle—0.5 mm.

Winged viviparous female.

White. Head, antennæ and mesothorax black. Stigma and veins gray? Abdomen with 3 large blackish patches on each side and some irregular patches on the dorsum. Cauda white. Cornicle very slightly dusky. Legs white, apices of femora and tibiæ, and tarsi black. (Described from specimens preserved in alcohol). Antennæ imbricated, without hairs; the 3rd joint provided with 46 circular sensoria of vorious sizes scattered over the whole length; the 4th provided with 20 sensoria; the 5th provided with 5+1 sensoria in a row; the relative length of joints as follows: III—106, IV—60, V—50, VI—138 (19+129). Rostrum reaching the middle coxæ. Fore wings with normal veins; hind wings with 2 somewhat divergent obliques; hooklets 3. Cornicles long, as long as the 4th antennal joint, almost reaching the base of the cauda, very slightly imbricated on the distal portion, somewhat

swollen about the middle, scarcely dilated at the base, about 8 times as long as wide, about twice as long as the cauda. Cauda with 2 pairs of lateral bristles. Legs long, with many setae.

Length of body—2.2 mm. Antenna—2.8 mm.

Cornicle—0.4 mm.

Host.—*Sonchus arvensis*.

Distribution.—Formosa: Taihoku, Kwanshirei.

Closely related to *A. oleraceae* (v. d. Goot), from which it differs in the more slender cornicles.

Amphorophora species.

(Pl. III, B, figs. 5—7)

Wingless viviparous female.

White, somewhat pale yellowish. Eyes black. Antennae white, apices of the 3rd, 4th, and 5th joints, and the 6th black. Cornicles white with black apices. Legs white, apical halves of femora, apices of tibiae, and tarsi black; tibiae somewhat pale brownish on the basal half. Cauda white. Body oval, with some short bristles. Frontal tubercles large, somewhat convex on the inner side. Antennae very long and slender, provided with a few short hairs; the 3rd joint provided with 1 or 2 small circular sensoria near the base; the 4th very slightly imbricated, lacking sensoria; the relative length of joints as follows: III—75, IV—53, V—48, VI—115 (18+97). Rostrum reaching beyond the hind coxae. Cornicles long, a little longer than the 4th antennal joint, about 1.8 times as long as the cauda, cylindrical, very slightly dilated about the middle and on the base, with a little imbrication at the tip. Cauda large, ensiform, with a few lateral bristles. Legs very long and slender; tibiae provided with many short bristles; tarsi rather short.

Length of body—2.1 mm. Antenna—about 3.2 mm.

Cornicle—0.6 mm.

Host.—*Pollia japonica*, attacking the leaf.

Distribution.—Formosa: Rimogan near Urai.

Collected by Messrs. Kurosawa and Sueta in July, 1921.

Fullawayella formosana Takah.

(Pl. IV, B, fig. 4)

Aphididae of Formosa—1, p. 29 (1921).

Wingless viviparous female.

Shining black. Head brownish black. Eyes black. Antennae black, with the 3rd joint yellowish brown. Cornicles brownish black. Cauda dark brown. Femora black, brownish at the bases, tibiae yellowish brown, with the apices black; tarsi black. Body almost without hairs. Frontal tubercles conspicuous, with the inner sides prominently converging. Antennae very long and slender, somewhat imbricated, with a few very small hairs; the 1st joint much larger than the 2nd, moderately convex on the inner side; the 3rd lacking sensoria; the 5th with a small apical sensorium; the relative length of joints as follows: III—75, IV—53, V—44, VI—86 (20+66). Rostrum reaching beyond the middle coxae. Cornicles scarcely imbricated, moderately dilated on the distal two thirds, slightly dilated on the base, shorter than the 5th antennal joint. Cauda large and stout, wider than the cornicle, broadest at the base, gradually tapering, almost without constrictions, the apex rounded, about one half the length of the cornicle, with a few short lateral bristles.

Legs long and slender, provided with some setae.

Length of body—about 1.7 mm. Antenna—about 2.2 mm.

Cornicle—about 0.3 mm.

Winged viviparous female.

Head blackish brown. Eyes black. Antennae black, brownish on the basal half of the 3rd joint. Prothorax and abdomen blackish brown. Mesothorax brownish black. Wings along the veins broadly clouded with fuscous; stigma gray; veins blackish. Femora black, brownish at the bases; tibiae pale brown, with black apices; tarsi black. Cornicles and cauda brownish black. Antennae long and slender, almost without hairs; the 3rd joint provided with about 30—35, the 4th 15—20, the 5th 2—5 circular or slightly oval sensoria of medium or rather large size scattered over the whole length, apical sensorium of the 5th large, circular; the relative length of joints as follows: III—80, IV—61, V—51, VI—107 (23+84).

Rostrum almost reaching the middle coxae. Wing veins rather stout, the 1st oblique on the front wing not curved; the 2nd slightly curved at the apical portion; subcosta provided with 4—5 sensoria mostly on the apical half; hind wings with 2 obliques which are sligthly divergent.

Length of body—1.8 mm. Antenna—about 2.4 mm;

Cornicle—about 0.3 mm.

Hosts.—*Allium fistulosus; Allium scorodoprasum var viviparum.*

The above description was made from the specimens on *Allium fistulosus.*

Distribution.—Formosa: Taihoku, Toyen, Shinten.

Rhopalosiphum avenae (Fab.)

Aphis avenae, Fabricius, Entom. Syst. iv, p. 214 (1794); Walsh, Proc. Entom. Soc. Philadelphia, p. 298 (1862); Del Guercio, Redia, ix, 2, p. 197 (1911); Börner, Sorauer's Handb Pflanzk. 3, p. 670 (1913); Davis, U. S. Dept. Agr. Bull. 112 (1914); Patch, Maine Agr. Expt. St. Bull. 233, pp. 256 and 266 (1914); Ewing, Biol. Bull. xxxi, 1, p. 54 (1916); Baker and Quaintance, U. S. Dept. Agr. Farmers' Bull. 804, p. 13 (1917); Essig and Kuwana, Proc. Calif. Acad. Sc. 4th ser. viii, 3, p. 67 (1918); Peterson, New Jersey Agr. Expt. St. Bull. 332 (1918); Matheson, Cornell Univ. Agr. Expt. St., Mem. 24, p. 750 (1919); Swain, Univ. Calif. Pub. iii, 1, p. 94 (1919); Peterson, Jl. Econ. Entom. xii, 5, p. 363 (1919) and Ann. Entom. Soc. America, xiii, 4, p. 391 (1920); Lathrop, Jl. Econ. Entom. xiv, p. 436 (1921).

Siphocoryne avenae, Pergande, U. S. Dept. Agr. Div. Entom. Bull. 44, pp. 1—13 (1904); Quaintance, U. S. Dept. Agr. Bureau Entom. Circular, 81, p. 3 (1907); Gillette, Jl. Econ. Entom. i, p. 308 (1908); Theobald, Can. Entom. 48, p. 235 (1916); Matsumura, Jl. Coll. Agr. Sapporo, vii, pt, 6. p. 359 (1917); Das, Mem. Indian Mus. vi, p. 194 (1918).

Aphis padi, Kaltenbach, Monog. Blattl. p. 74 (1843); Koch, Die Pflanz. p. 110, figs. 147—148 (1857); Mordvilko, Horae Entom. Soc. Russicae, xxxi, p. 276 (1898).

Siphonaphis padi, van der Goot, Beiträge Kenntn. Holland. Blattl. p. 241 (1915) and Contrib Fauna Indes Neerland, i, 3, p. 71 (1918); Mordvilko,

Les Pucerons des Graminees, 1, p. 52 (1921) and Bull. Entom, Research, xiii, pt. 1, p. 30 (1922).

Aphis annuae, Oestlund, Geol. Nat. Hist. Survey, Minnesota, p. 43 (1886) and p. 66 (1887).

Aphis maidis, Essig, Pom. Jl. Entom. iv, p. 790 (1912).

Aphis pseudoavenae, Patch, Maine, Agr. Expt. St. Bull. 267 (1917).

Aphis africana, Theobald, Bull, Entom. Research, iv, p. 330 (1914).

Aphis prunifoliae, Baker, Science, 1191, p. 1 (1917).

Rhopalosiphum prunifoliae, Baker and Turner, Jl. Agr. Research, xvii, 6, p. 311 (1919).

Toxoptera rufiabdominalis, Sasaki, 日本農作物害蟲編 p. 202 (明治三十四年). 素木得一農事試驗場特別報告 (臺北) No. 8, p. 131 (大正二年).

Yamataphis rufiabdominalis, Matsumura, Jl. Coll. Agr. Sapporo, vii, pt. 6, 363 (1917); Takahashi, Aphididae of Formosa, 1, p. 43 (1921).

Yamataphis oryzae, Matsumura, Jl. Agr. Sapporo, vii, pt. 6, p. 413 (1917).

Yamataphis papaveris, Takahashi, Aphididae of Formosa, 1, p. 39 (1921.)

Rhopalosiphum papaveris, Takahashi, Aphididae of Formosa, 1, p. 34 (1921)

In the author's opinion, *Aresha shelkovnikovi* Mordwilko (Les Pucerons des Graminées, 1, p. 54, 1921) seems to be a synonym of this species.

Hosts in Formosa.—*Prunus mume; Papaver somniferum; Oryza sativa.*

Distribution.—Formosa: Shinchiku, Tainan.

Japan: Tokyo, Sapporo.

Europe, North America, Java, India, Africa, Australia.

Cavariella araliae Takah.

Aphididae of Formosa—1, p. 37, Pl. xiii, 2, f. 1 (1921).

Winged viviparous female.

Body without hairs. Head with a few very small hairs. Frontal tubercles absent. Antennae short, 5—jointed, imbricated, without hairs; the 3rd joint provided with about 30 mostly large, circular sensoria scattered over the whole length; the 4th with a large, circular apical sensorium; the relative length of joints as follows: III—61, IV—18, V—45 (18+27). Rostrum reaching beyond the middle legs. Wings normal; hind wings with 2 not parallel

obliques; subcosta of the fore wing provided with about 6 small sensoria on the distal half; hooklets 3. Cornicles slender, a little shorter than the last antennal joint, 2.5 times as long as the tubercle above the cauda, almost reaching the caudal apex, roughly imbricated, moderately dilated on the distal half, scarcely dilated at the base, about 7 times as long as wide.

Abdomen above the cauda with a slender tubercle, which is almost as long as the 4th antennal joint. Cauda normal.

Legs slender, with many moderately long setae.

Length of body—2.0 mm. Antenna—1.0 mm.

Cornicle—about 0.3 mm.

The winged form was hitherto unknown.

Cavariella neocaprae Takah.

Aphididae of Formosa—1, 0. 37, pl. ix. 1, figs. 10—16 (1921).

Wingless viviparous female.

Green. Eyes black. Antennae pale green, with the distal halves dusky. Cornicles, cauda and abdominal horn almost green. Legs green, tarsi dusky. Body oblong, without hairs. Frontal tubercles very short. Antennae rather short, somewhat imbricated, 5—jointed, without hairs; the 3rd joint lacking sensoria; the 4th provided with a rather large circular sensorium at the apex; the relative length of joints as follows: III—57, IV—16, V—38 (15 + 23). Eyes not large, ocular tubercles rather small. Rostrum almost reaching the hind coxae. Cornicles long and slender, somewhat imbricated, somewhat dilated at the apical portion, not dilated at the base, about 1.7 times as long as the horn above the cauda, but not reaching its apex, as long as the 3rd antennal joint, almost thrice as long as the cauda. Horn above the cauda long, almost 1.5 times as long as the cauda. Cauda stout, much broader than the cornicle, somewhat longer than wide, broadest at the base, narrowed toward the apex on the distal half, with 2 slight constrictions, the apex rounded, the lateral bristles short. Legs provided with some setae; hind tarsi almost as long as the 4th antennal joint.

Length of body—about 2.0 mm. Cornicle—about 0.4 mm.

Antenna—1.0 mm.

Aphis malvoides v. d. Goot?

Contrib. Faun. Ind. Neerl. 1, iii, p. 96 (1917).

Wingless viviparous female.

Yellow or greenish yellow. Eyes, cornicles, cauda and anal plate black. Antennae pale yellow, apex of the 4th joint slightly dusky, apex of the 5th, and the 6th black. Legs pale yellow, apices of femora and tibiae, and tarsi black. Head provided with a few moderately long hairs. Antennae imbricated, with a few rather short hairs; the 3rd joint without sensoria; the relative length of joints as follows: III—31, IV—20, V—20, VI—44 (15 + 29). Rostrum reaching beyond the middle coxae. Prothorax and the 1st and 7th abdominal segments each with a very small lateral tubercle. Cornicles rather stout and short, as long as the 4th and 5th antennal joints taken together, imbricated, tapering, not curved, 1½ times as long as the cauda. Cauda stout, almost as long as the 3rd antennal joint, provided with many long hairs. Legs with some moderately long setae.

Length of body—1.9 mm. Antenna—1.0 mm.

Cornicle—about 0.3 mm.

Winged viviparous female.

Yellow or greenish yellow. Eyes, antennae, thorax, cornicles and cauda black. Head provided with a few moderately long hairs. Frontal tubercles almost absent. Antennae imbricated, with a few hairs; the 3rd joint provided with 7—11 large circular sensoria not in a row almost over the whole length; the 4th with 2—3 similar sensoria; the relative length of joints as follows: III—33, IV—23, V—23, VI—50 (14 + 36). Rostrum reaching the middle coxae. Prothorax and the 1st and 7th abdominal segments with a very small lateral tubercle. Wings normal; hind wings with 2 parallel obliques; hooklets 3.

Abdomen almost lacking hairs. Cornicles cylindrical, a little shorter than the 3rd antennal joint, imbricated, somewhat tapering, scarcely curved, 1½ times as long as the cauda. Cauda with many bristles, 1.5 times as long as the hind tarsi. Legs with many setae.

Body—2.0 mm. Antenna—1.0 mm.

Fore wing—3.0 mm.

Host.—*Bidens willichii*.

Distribution.—Formosa: Taihoku.

Java (v. d. G.); Singapore (v. d. G.).

Hitherto unrecorded from Formosa.

Aphis nerii Boyer.

(Pl. IV, B, figs. 5—10).

Boyer, Ann. Ent. Soc. France, x, p. 167 (1841); Theobald, Bull. Entom. Res. iv, p. 328 (1914); van der Goot, contrib. Fauna Ind. Neerland, I, iii, p. 101 (1917); Das, Memoirs Ind. Mus., vi, 4, p. 204 (1918); Moreira, Bull. Soc. Ent. France, pp. 236—238 (1919).

Wingless viviparous female.

Yellow. Antennae black, with the bases paler. Eyes, cornicles and cauda black. Legs black, with the bases of femora yellowish.

Body provided with a few hairs. Head with some moderately long bristles. Frontal tubercles very short. Antennae imbricated, the 3rd joint without sensoria, provided with about 15 moderately long bristles; the relative length of joints as follows: III—63, IV—48, V—39, VI—79 (15+64). Rostrum reaching the hind coxae. Prothorax and the 1st and 7th abdominal segments with a very small lateral tubercle which is not sharply pointed. Cornicles large and stout, cylindrical, somewhat dilated towards the base, not curved, imbricated, almost twice as long as the cauda, much longer than the 6th antennal joint, reaching the middle of the cauda. Cauda stout, with some bristles. Legs long, with many rather long brisltes.

Length of body—about 2.5 mm. Antenna—2.0 mm.

Cornicle—0.75 mm.

Winged viviparous female.

Yellow. Head blackish brown. Antennae, eyes, thorax, cornicles and cauda black. Legs yellowish brown, with the apices of femora and tibiae, and tarsi black. Wings hyaline, stigma and veins gray. Abdomen with a black

marking at the base of the cornicle and some small black patches on the sides.

Head with some bristles. Frontal tubercles almost absent. Antennae imbricated, with a few short bristles; the 3rd joint provided with about 12 circular sensoria of medium or rather large size distributed almost over the whole length, not in a row; the 4th with about 5 sensoria in one row; the 5th with the usual one; the relative length of joints as follows: III—58, IV—50, V—38, VI—85 (16—69). Rostrum reaching the hind coxæ. Lateral tubercles of the body as in the wingless form. Cornicles cylindrical, much smaller than those of the wingless form, somewhat expanded at the base, imbricated, not curved, almost twice as long as the cauda, as long as or a little longer than the 3rd antennal joint, not reaching the caudal apex. Cauda with many long bristles. Legs very long, with numerous moderately long bristles. Wings normal; obliques on the hind wing parallel; hooklets 3.

Length of body—2.0 mm. Antenna—1.5 mm.

Fore wing—3.5 mm.

Host.—*Asclepias curassavica*.

Distribution.—Formosa Taihoku.

Java (v. d. G.); India (Das); Europe.

Hitherto unrecorded from Japan.

Collected by Mr. E. Kurosawa.

My specimens differ from those described by Mr. Swain (Univ. California Pub. vol. 3, No. 1, p. 117, 1919) in having sensoria on the 4th antennal joint of the winged viviparous female.

Aphis lilii Licht?

Lichtenstein, Flore. Aphid. p. 33 (1884)

Wingless viviparous female.

Blackish green. Eyes and cornicles black. Antennæ pale brownish, apices of the 3rd, 4th and 5th joints and the 6th black. Cauda blackish green. Legs pale brownish, apices of femora very slightly dusky; apices of tibiæ, and tarisi black.

Body without hairs. Frontal tubercles very short, slightly convex on the

Body oval, without hairs. Frontal tubercles very short, but the inner side somewhat developed, with a very small blunt tubercle. Antennæ imbricated, lacking hairs; the Ist joint slightly convex on the inner side; the 3rd without sensoria; the relative length of joints as follows: III—51, IV—29, V—24, VI—87 (13+74). Rostrum stout, reaching beyond the the middle coxæ. Prothorax and the 1st and 7th abdominal segments each with a very small lateral tubercle. Cornicles very long and slender, slightly shorter than the 3rd antennal joint, cylindrical, imbricated except on the distal portion, very slightly dilated at the base, almost 3 times as long as the cauda. Cauda normal in shape, as wide as or more slender than the cornicle, very slightly longer than the hind tarsi, slightly constricted about the middle, provided with 2 pairs of very long lateral bristles.

Legs long, provided with many long bristles.

Length of body—1.5 mm. Antenna—1.6 mm.

Cornicle—0.37 mm.

Winged viviparous female.

Antennæ: the 3rd joint provided with 7 large circular sensoria in a row over the whole length; the 4th with 1—2 similar sensoria; the 5th with the usual one; the relative length of joints as follows: III—47, IV—26, V—20, VI—? (12+?),

Host.—*Mariscus sp.*

Collected by Mr. E. Kurosawa in October 1920. (Taihoku).

Aphis species.

(Pl. III, A, figs. 9—10 & Pl. III, B, fig. 1)

Wingless viviparous female.

Green. Eyes black. Antennæ blackish, paler at the bases. Cornicles pale brown, with the apices blackish. Legs pale grayish green, with the apices of tibiæ, and tarsi very slightly dusky. Cauda green. Body oval, without hairs. Frontal tubercles almost absent. Antennæ short, imbricated, lacking hairs; the 3rd joint lacking sensoria; the relative length of joints as follows: III—18, IV—13, V—14, VI—42 (10+32). Rostrum very stout, reaching a

inner side. Antennæ imbricated, lacking hairs; the 3rd joint lacking sensoria; the relative length of joints as follows: III—35, IV,—23, V—24, VI—49, (13+36). Rostrum reaching the hind caxæ. Prothorax and the 1st and 7th abdominal segments with a small lateral tubercle. Cornicles cylindrical, rather stout, slightly broadened towards the base, not curved, imbricated, as long as the 3rd antennal joint, about 1.5 times as long as the cauda. Cauda a little longer than the hind tarsi, with 3 pairs of very long lateral bristles. Legs long and slender, provided with many moderately long setæ; hind tarsi almost as long as the base of the last antennal joint.

Length of body—about 1.5 mm. Antenna—1.15 mm.

Cornicle—0.37 mm.

Winged viviparous female.

Blackish green. Body lacking hairs. Antennæ imbricated, lacking hairs; the 3rd joint provided with 6—8 rather large or medium sized circular sensoria in one row over the whole length; the 4th provided with 0—2 sensoria; the 5th with the usual apical sensorium; the relative length of joints as follows: III—39. IV—32, V—29, VI—56 (14+42). Rostrum reaching the hind caxæ. Prothorax and the 1st and 7th abdominal segments each with a small lateral tubercle. Wings normal; hind wings with 2 parallel obliques; hooklets 3. Cornicles cylindrical, slightly broadened at the base, imbricated, slightly shorter than the 3rd antennal joint, about 1.5 times as long as the cauda. Cauda longer than the hind tarsi.

Length of body—1.3 mm. Antenna—1.2 mm.

Cornicle—0.22 mm. Fore wing—2.4 mm.

Host.—*Lilium, spp.*

Distribution.—Formosa: Taihoku, Kiirun, Shinchiku.

Aphis species.

(Pl. II, A, fig. 10).

Wingless viviparous female.

Blackish green. Antennæ, eyes and cornicles black. Legs pale brown, apices of femora and tibiæ, and tarsi dusky.

little beyond the middle coxæ. Body without lateral tubercles. Cornicles short and rather stout, very slightly imbricated, not reaching the cauda, slightly or not curved, prominently constricted at the tip, about 2.4 times as long as wide, 1.5 times as long as the cauda. Cauda normal in shape, as long as the hind tarsi, provided with 2 pairs of rather short lateral bristles. Legs stout; tibiæ with some moderately long bristles; hind tarsi shorter than the cornicles.

Length of body—1.2 mm. Antenna—0.7 mm.

Hosts.—*Lobelia radicans*; *Cyperus iria*.

Distribution.—Formosa: Taihoku.

It is needless to say that this is not a typical *Aphis*, but it does not seem to fit in other proposed genera.

A wingless viviparous female was collected on the leaf of *Lobelia radicans* in March 1921 and some were found on the leaves of *Cyperus iria* in October 1921.

Cerosipha species.

Wingless viviparous female.

Green, sometimes slightly yellowish. Eyes black. Antennæ, cornicles and cauda green. Legs green, tarsi slightly dusky.

Body oval, without hairs, not pulverulent. Frontal tubercles very short. Antennæ very short, imbricated, 5-jointed, lacking hairs; the 3rd joint lacking sensoria; the relative length of joints as follows: III—22, IV—12, V—23 (9+14). Rostrum reaching the middle coxæ. Body without lateral tubercles. Cornicles cylindrical, rather stout, slightly tapering, very slightly curved, almost as long as the 3rd and 4th antennal joints taken together, almost 1.5 times as long as the cauda. Cauda stout, much broader than the cornicle, broadest at the base and grandually tapering when seen from above, 1.5 times as long as wide, provided with 3 pairs of lateral bristles. Hind tarsi much shorter than the cauda.

Length of body—about 1.3 mm. Antennæ—0.5 mm.

Host.—*Artemisia capillaris*, attacking the leaf and stem.

Distribution.—Formosa: Taihoku.

Cryptosiphum artemisiæ Buckt.

(Pl. V, B, fig. 3)

Buckton, Monog. Br. Aphid. II, p. 144, pl. LXXXIV (1877); Haviland, Entom. Mth. Mag. LIV, 652, p. 202 (1918).

Host—*Artemisia vulgaris* var. *indica*.

Distribution.—Formosa: Taihoku.

Europe.

Hitherto unrecorded from Formosa.

Brachysiphoniella gramini (Takah).

(Pl. VII, B, figs. 1—6)

Aphididæ of Formosa—1, p. 62, pl. xiv, 1, figs. 5—6 (1921).

Winged viviparous female.

Colour almost as in the wingless form. Body, antennæ, eyes, cornicles, and cauda blackish. Wings hyaline. Body oblong, without long hairs. Frontal tubercles very short. Eyes large. Antennæ rather stout, imbricated, without hairs; 3rd joint provided with about 15—22 rather large, protruding circular sensoria scattered over the whole length; the 4th provided with about 10 similar sensoria; the 5th with a rather small sensorium near the distal end; the relative length of joints about as follows: III—21, IV—18, V—18, VI—36 (11+25). Rostrum stout, not reaching the middle coxæ. Wings with the 3rd oblique twice forked and extending to the apex of the wing; hind wings with 2 somewhat divergent obliques; hooklets 2 or 3. Abdominal segments provided with some very short hairs arranged transversely on the dorsum. Cornicles very short, scarcely imbricated, wider than long, broadened toward the base. Cauda very long, much longer than the cornicle, a little shorter than the 4th antennal joint, provided with some pairs of lateral bristles.

Length of body—about 1.4 mm. Antenna—about 1.0 mm.

Fore wing—about 2.3 mm.

Host.—*Leersia hexandra*.

This species is very closely allied to *Aphis siphonella* Essig et Kuw and it is possible that the former may be a synonym of the latter.

Callipterus kahawaluokalani (Kirk.)

Takahashi, Aphididæ of Formosa—1, p. 74 (1921)

Winged male.

Color almost as in the winged viviparous female. Body without hairs. Head with a very short blunt tubercle on the front near the base of each antenna. Frontal ocellus placed on an elevated area. Eyes very large, outstanding. Antennæ lacking hairs; the 3rd joint provided with 15—16 very large transverse sensoria in one row over the whole length; the 4th with 4—5 large circular or oval sensoria; the 5th with 6 similar sensoria; the base of the 6th with 3 similar sensoria; the relative length of joints as follows: III 37, IV—23, V—24, VI—30 (17 + 13). Rostrum short, not reaching the middle coxæ. Wings almost as in the winged viviparous female; subcosta of the fore wing provided with 3—4 very small sensoria. Dorsal tubercles as in the winged viviparous female. Cornicles a little shorter than wide, scarcely constricted about midlength, shorter than the lateral tubercle on the 4th abdominal segment.

Length of body—about 1.0 mm. Antenna—about 0.85 mm.

Fore wing—1.4 mm.

Collected by the writer in October 1921, in Taihoku.

Wingless oviparous female.

Yellow. Small tubercles on the dorsum, from which black capitate hairs arise, black. Head blackish. Eyes dark brown. Antennæ pale yellow, with the distal halves of the 3rd, 4th and 5th joints, and the 6th black. Cornicles black. Cauda yellow. Legs pale yellow, apical halves of femora and basal parts of tibiæ dusky; tarsi yellow. Head provided with 2 pairs of very long capitate hairs arising from small tubercles between the antennæ and 4 similar hairs in a transverse row near the hind margin. Eyes protuberant, moderate in size. Frotal tubercles absent. Antennæ without hairs; the 1st joint much shorter than the hairs on the head; the 3rd slightly imbricated at the tip, without sensoria; the relative length of joints as follows: III—23, IV—13,

V—16, VI—27 (15+12). Rostrum reaching the middle coxæ. Pronotum provided with a pair of very long capitate hairs arising from small tubercles at the middle of the dorsum and 4 similar hairs in a transverse row near the hind margin; meso-and metanotum with 4 similar capite hairs arranged in a transverse row. The 1st, 2nd, 3rd and 4th abdominal segments each provided with 4 capitate hairs arising from small tubercles in a transverse row on the dorsum; the 5th, 6th and 7th segments with a pair of similar hairs at midlength of the dorsum; the 8th with a pair of long normal bristles, which are not black, on the dorsum. All the capitate hairs on the head, thorax and abdomen subequal in length. Cornicles as in the viviparous form. Cauda slightly constricted. Anal plate large, rounded, not bilobed, provided with many long bristles. Legs with many bristles; hind tibiæ rather thick, provided with many rather small circular sensoria; tarsi normal in length.

Length of body—about 1.3 mm. Antenna—0.75 mm.

Collected in November 1921 in Taihoku.

Host.—*Lagerstrœmia sp.*

Eutrichosiphum minutum n. sp.

Wingless viviparous female.

Shining black. Cornicles black. Head yollowish brown. Body provided with many very long bristles which are not capitate. Head with many long bristles. Frontal tubercles very short. Antennæ short, 5-jointed; the 3rd joint provided with about 8 very long bristles, without sensoria; the 4th very slightly imbricated, with 4 long bristles, the apical sensorium circular and rather large; the 5th provided with 2 bristles; the relative length of joints as follows: III—40, IV—22, V—55 (17 + 38). Ocular tubercles prominent. Rostrum reaching beyond the hind coxæ. Pronotum fused with the head. Spiracles not protuberant, Abdomen almost circular.

Cornicles short and stout, as long as the last antennal joint, prominently dilated at midlength, norrowest at the tip, 4 times as long as wide, with many long bristles. Caudal segment not produced into a process. Legs with some long bristles.

Length of body—1.6 mm. Antenna—1.0 mm.
Cornicle—0.45 mm.

Winged viviparous female.

Antennæ, cornicles and stigma black. Veins dark brown. Body provided with many long bristles.

Head with a pair of very short, blunt tubercles on the front which is provided with many longer bristles. Frontal tubercles very short. Antennæ 5-jointed; the 3rd joint provided with about 10 very long bristles and only 2 circular or oval, usually large sensoria in a longitudinal row on the basal half; the 4th somewhat imbricated, with 5 very long bristles; the relative length of joints as follows: III—60, IV—32, V—? (18 + ?). Rostrum reaching beyond the hind coxæ. Head and pronotum well defined. The 2nd oblique curved; the 3rd oblique twice forked; stigmatic vein almost straight; hind wings with 2 not parallel obliques; hooklets 3. Cornicles long and slender, somewhat dilated on the distal two-thirds, longer than the 3rd antennal joint, about 8 times as long as wide, with many very long bristles which are longer than those on the remainder of the body. Cauda without a process. Legs with some long bristles.

Length of body—1.6 mm. Cornicle—0.6 mm.

Host.—*Trachelospermum jasminoides.*

Distribution.—Formosa: Kagi, Kwanshirei.

This aphis is very common in March.

Dilachnus species.

Wingless viviparous female.

Differs from *Dilachnus sp.* (Aphididae of Formosa—1, p. 82, 1921) as follows:

(1) Body much larger, measuring about 4.5 mm. in length.

(2) Antennae provided with some short setae; the 5th joint with 2 circular sensoria near the apex; the relative length of joints as follows: III—92, IV—41, V—41, VI—?

(3) Hairs on the legs shorter.

(4) The second tarsal joint ralatively shorter.

Host—*Pinus sp.*, attacking the young shoot.

Distribution.—Formosa: Shinten near Taihoku.

Two specimens were collected by the author on March 15, 1922.

Dilachnus piniformosanus n. sp.

Dilachnus species, Takahashi, Aphididæ of Formosa, part 1, p. 82 (1921).

Lachnus pini, Maki. 林業試驗場特別報告第一號 (台北) p. 35, pl. VI, A.

Winged viviparous female.

Dark brown. Body oval, covered with many long rather fine hairs. Head divided. Eyes protuberant; ocular tubercles very small. Antennæ with many very long hairs; the 3rd joint provided with 7—10 protuberant circular sensoria of medium or large size arranged in one row over the whole length except the basal portion; the 4th with 2 sensoria; the 5th with a sensorium near the apical one; the relative length of joints nearly as follows: III—35, IV—15, V—20, IV—12. Rostrum reaching beyond the hind caxæ, Wings hyaline; stigma large and stout; the 1st oblique on the fore wing almost straight; the 2nd curved; the 3rd faint, twice forked; stigmatic vein almost straight, reaching the tip of the wing; hind wings with 2 divergent obliques; hooklets 5. Cornicles on hairy cones. Cauda short, broader than long, broadest at the base, tapering, hairy. Legs long and slender, covered with many very long fine hairs; the 2nd tarsal joint of the hind leg about 2.5 times as long as the 1st.

Length of body—abaut 3.5 mm. Antenna—1.5 mm.

Fore wing—5.2 mm.

Host.—*Pinus spp.* attacking the twig.

Distribution.—Formosa: Taihoku. Japan: Tokyo.

Closely related to *Dilachnus pineti* Koch.

Eulachnus rileyi (Williams). ?

Lachnus rileyi, Williams, Aphididæ of Nebrasca, p. 24 (1911).

Eulachnus rileyi, Wilson, Entom. News XXX, 1, p, 5 (1919).

Wingless viviparous female.

Yellowish brown. Eyes brown. Antennæ pale yellowish brown, apices

of the 3rd, 4th and 5th joints, and distal half of the 6th somewhat dusky. When placed in balsam many small dusky spots are visible on the body, from each of which arises a long bristle. Legs yellowish brown, tarsi slightly dusky. Cornicles and cauda yellowish brown. Body much elongated, narrow, provided with many bristles, and slightly covered with a powder. Head divided, almost as long as the prothorax, provided with 9 long bristles on each half of the dorsal surface. Eyes without ocular tubercles. Antennæ provided with many rather stout bristles; the 3rd joint somewhat striate on the distal portion, without sensoria; the 4th without sensoria; the 5th and 6th each provided with a large circular sensorium; the relative length of joints as follows: III—39, IV—20, V—25, VI—20. Rostrum reaching beyond the middle coxæ. Hairs on the abdomen stout, shorter than those on the head. Cornicles very short, not on hairy cones. Cauda semicircular when seen from above, provided with some longer bristles. Legs very long and slender, covered with numerous rather long stout hairs; tarsi slender.

Length of body—about 2.3 mm. Antenna—about 1.2 mm.

This wingless form differs from that of *E. piniformosanus* Takah. (Aphididæ of Formosa.—1, p. 83, 1921) as follows:

(1) General colour yellowish brown.
(2) Hairs on the body shorter.
(3) Head with 9 hairs on each half of the dorsal surface. (In *E. piniformosanus* Takah. with 8 hairs).
(4) Rostrum shorter, not reaching the hind coxæ.
(5) Body longer.

Brachypterous viviparous female.

The 3rd antennal joint without sensoria, the 4th with a small sensorium at the apex; the relative length of joints as follows: III—35, IV—19, V—23, VI—18. Rostrum not reaching the hind coxæ. Wings very short, of nymphal character. Thorax not well doveloped.

Length of body—about 2.2 mm. Antenna—about 1.1 mm.

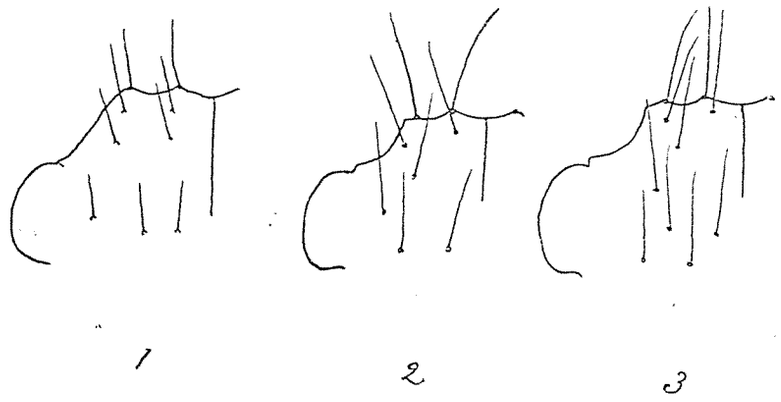
Host.—*Pinus massoniana*, attacking the leaf.

Distribution.—Formosa: Taihoku.

North America.

Many wingless viviparous females and a number of brachypterous forms (intermediates) were observed on July 30, 1922, near Taihoku.

The aphis directs the head downwards when at rest and walks very actively when disturbed.



(1) Head of *Eulachnus rileyi* Will? (Wingless viviparous ♀)
(2) Head of *E. piniformosanus* Takah. (Wingless viviparous ♀)
(3) Head of *E. piniformosanus* Takah. (Winged viviparous ♀)

Oregma panicola (Takah.)

(Pl. V. B, fig. 5 & Pl. VI. B, figs. 2—3 & Pl. IX, A)

Aphididæ of Formosa—1, p. 90 (1921).

Wingless viviparous female.

Dark brown, somewhat purplish. Body oval, moderately convex on the dorsum, covered with some waxy secretions. Wax-pores well developed, of "*montana*-type" of v. d. Goot. Head fused with the prothorax, provided with a few bristles. Eyes very small, composed of 3 facets. Antennæ very short, 4-jointed, with a few bristles, the 3rd joint with a very small apical sensorium; the relative length of joints as follows; III—15, IV—15.

Hornlets almost as long as or shorter than the 2nd antennal joint, rounded at the apex. Rostrum very stout, not reaching the middle coxæ. Cornicles very short, much wider than long, striate, expanded toward thhe base. Cauda much wider than long, constricted at the base, provided with some long bristles.

Anal plate bilobed, with some long bristles. Legs provided with some

rather long bristles; hind tarsi longer than the 3rd antennal joint, provided with a few very long capitate hairs.

Length of body—about 1.4 mm. Antenna—about mm.

Wax-pores large, circular, distributed as in *Oregma montana* v. d. Goot; number of lateral pores in one group as follows: prothorax—5—6, mesothorax 9—10, metathorax 5—6, the first abdominal segment 3, the 2nd abd. 3, the 3rd abd. 4—5, the 4th abd. 5, the 5th abd. 3, the 6th abd. 5, the 7th abd. 6; number of dorsal pores in one group as follows: head 5, prothorax 3, mesothorax 8—9, metathorax 4, the 1st abd. 3—4, the 2nd abd. 3—4, the 3rd abd. 4—6, 4th abd. 3, the 5th obd. 2; the 8th abd. 8 in a group on the middle of the dorsum. (see Pl. IX, A, fig. 2).

Host.—*Panicum palens.*

Distribution.—Formosa: Taihoku, Urai.

Oregma bambusicola Takah.

(Pl. VIII, A, fig. 3 & Pl. IX, B)

Aphididæ of Formosa—1, p. 89 (1921).

Wingless viviparous female.

Dark purple or purplish black. In the specimen treated with caustic potash, head and pronotum brownish, mesonotum with 4 large brownish patches, metanotum and the 1st abdominal segment with some brownish patches which are irregular in shape.

Body soft, oval, conspicuously convex on the dorsum, provided with numerous very small wax pores, which are irregular in shape, as in *Aleurodaphis blumeæ* v. d. Goot; very slightly covered with waxy secretions, furnished with some moderately long hairs.

Head fused with the prothorax. Horns rather slender, almost as long as or a little longer than the 2nd antennal joint, rather sharply pointed. Eyes composed of 3 facets. Antennæ provided with a few long hairs; the 3rd joint lacking sensoria; primary sensoria very small; the relative length of joints as follows: III—38, IV—27, V—35. Rostrum almost reaching the middle coxæ. Cornicles very short, much wider than long. Cauda much wider than long, wider than the lobe of the anal plate, striate, somewhat constricted at

the base, provided with many long stout bristles. Anal plate bilobed, provided with many long stout bristles. Legs long, provided with many long bristles; hind tarsi a little longer than the 3rd antennal joint, provided with a few very long hairs which are scarcely capitate.

Length of body—about 3.6 mm.

Antenna—about 0.6 mm.

(Described from specimens collected on Nov. 12, 1922, near Taihoku).

Winged viviparous female.

Head, eyes, antennae, mesothorax and abdomen almost black. Prothorax blackish brown. Veins and stigma almost black. Legs yellowish brown; apices of femora, and tarsi black. Cauda brownish.

Body broad, flattened, not covered with waxy secretions. Head much broader than long, provided with many very short hairs.

Horns much shorter than the 1st antennal joint, not sharply pointed, expanded toward the base, provided with some minute hairs. Eyes large, not well protruding. Antennae long; the 3rd joint provided with 37—47, the 4th 16—21, the 5th 11—15 rings; the relative length of joints as follows: III—132, IV—66. V—58. Rostrum short, not reaching the middle coxae. Mesothorax large. Wings ample, carried flat when at rest; veins rather stout; the 1st and 2nd obliques on the fore wing united at their bases, slightly curved; the 3rd obsolete at the base, once forked; subcosta provided with about 8 very small sensoria in a group near the base, about 12 sensoria along the whole length, and a few short bristles mostly on the basal half; hind wings with 2 divergent obliques; hooklets 2 or 3. Abdomen provided with some rather short beristles. Cornicles almost as in the apterous form. Spiracles slightly protuberant. Cauda and anal plate almost as in the apterous from. Legs slender; tibiae provided with many somewhat long bristles; the 2nd tarsal joint very long, that of the hind leg about $\frac{2}{3}$ times as long as the 5th antennal joint.

Length of body—about 3.0 mm. Antenna—about 1.25 mm.

Fore wing—about 3.8 mm.

The winged forms are very rare, having been collected only on November 12 and 20, 1922, near Taihoku.

Oregma orientalis n. sp.

Wingless viviparous female.

Reddish brown, somewhat purplish. Eyes black. Legs and antennae pale. Body depressed, slightly convex, densely covered with white secretions as in *O. lanigera* (Zehnt.), with some moderately and rather long bristles. Head fused with the prothorax. Antennae 4—jointed; the 3rd joint with a few bristles, the apical sensorium very minute; the relative length of joints as follow: I—6, II—7, III—18, IV—14. Hornlets almost as long as the 1st antennal joint, sharply pointed. Eyes composed of 3 facets. Rostrum very short, reaching a little beyond the front legs. Cornicles represented almost as pores. Anal plate bilobed. Cauda constricted at the base. Legs with some bristles. Wax-plates well developed, circular; head lacking wax-plates; each thoracic and abdominal segment with about 5—10 wax-plates in a group on each side; the 8th abdominal segment with about 20 wax-plates at the middle of the dorsum.

Length of body—1.65 mm. Antenna—0.4 mm.

Host.—*Arthraxon ciliaria?*

Distribution.—Formose: Taihoku, Kwanshirei

Oregma montana van der Goot.

Contrib. Fauna Indes Neerland. 1, 3, p. 205 (1918)

Host.—*Bambusa nana.*

Distribution.—Formosa: Urai.

Hitherto unrecorded from Formosa.

Genus Astegopteryx Karsch.

Syn. *Nipponaphis* Pergande, 1906.
Schizoneuraphis van der Goot, 1916.
Thoracaphis van der Goot, 1916.

The genus *Nipponaphis* was considered by Dr. Baker as being a synonym of *Astegopteryx*. *Schizoneuraphis* van der Goot was considered by Dr. Baker

and the author (Bull. Brooklyn Entom. Soc. xv, 4, p. 115, 1920) as a synonym of *Nipponaphis*.

The genus *Thoracaphis* is composed of the apterous viviparous females of *Astegopteryx* and it must be considered as being a synonym of the latter. The males and oviparous females and also the gall-inhabiting viviparous females of *Astegopteryx* are not aleyrodiform, being provided with well developed legs and rostrum, but the wingless viviparous females which do not live in galls are aleyrodiform, without well developed legs, eyes and antennae, being cemented to the host.

In Formosa five species, *A. quercicola* Takah., *A. gigantcum* Takah., *A. fici* n. sp., *A. styracophila* Kar. and *A. styracicola* Takah., are now known.

Astegopteryx styracicola Takah.

Aphididae of Formosa—1, p. 94 (1921).

Winged viviparous female.

Body oblong, without secretions. Head moderate in size, lacking horns. One of the ocelli situated on the front. Eyes large, ocular tubercles very small.

Frontal tubercles absent. Antennae rather slender; sensoria distributed as follows: III—17....23, IV—6....9, V—5....7; the primary sensorium of the 5th joint very small; the relative length of joints as follows: III—75, IV—26, V—23. Rostrum not reaching the middle coxae. Thorax normal. The 1st and 2nd obliques united at their bases, slightly curved; the 3rd once forked, obsolete at the base; hind wing with 2 divergent obliques; hooklets 2. Abdomen provided with a few moderately long bristles. Cornicles very short, scarcely protruding. Cauda short, much wider than long, broadest at the base, with some bristles. Anal plate scarcely bilobed. Legs slender, with some setae; hind tarsi almost as long as the 4th antennal joint; the 2nd tarsal joint with 2 very long capitate hairs.

Length of body—1.55 mm. Antenna—about 0.65 mm.

Fore wing—about 2.5 mm.

Host.—*Styrax formosanum*, producing galls.

Distribution.—Formosa: Kannon-zan.

Astegopteryx styracophila Karsch?

(Pl. VIII, B, figs. 7—12)

Ber. deutsch Bot. Ges., v. 8, p. 52 (1890).

Winged viviparous female.

Head, antennae and thorax black. Eyes black, somewhat brownish. Wings almost hyaline; stigma dark green; subcosta black; veins brownish. Legs gray or blackish. Cauda yellowish green.

Body oblong, without white secretions. Head moderate in size, lacking horns. Eyes very large: ocular tubercles very small. Frontal tubercles absent. One of the ocelli situated on the front. Antennae somewhat stout; the 3rd joint with about 20, the 4th 8—9, the 5th 8 annulations; the primary sensorium of the 5th small, somewhat protruding; the relative length of joints as follows: III—50, IV—21, V—24. Rostrum very short. not reaching the middle coxae. Thorax normal. Wings carried flat when at rest; subcosta of the fore wing provided with 5 very small circular sensoria arranged in one row at the base and about 10 small sensoria almost along the whole length, and some short bristles are present; the 1st and 2nd obliques united at the bases, somewhat curved; the 3rd once forked, obsolete at the base; hind wings with 2 somewhat divergent obliques; hooklets 2. Abdomen provided with some moderately long bristles. Spiracles slightly protuberant. Cornicles very short, slightly protuberant. Cauda very short, much wider than long, rounded, not constricted at the base.

Anal plate bilobed, but not tiefly, provided with some long bristles.

Legs with many setae; hind tarsi almost as long as the 4th antennal joint, tarsi with a few very long capitate hairs.

Length of bady—about 1.7 mm. Fore wing—about 2.25 mm.

Antenna—about 0.6 mm.

Host—*Styrax suberifolium*, producing galls.

Distribution.—Formosa: Sozan. Java (Karsch).

Many winged viviparous females and the nymphs were collected on October 16, 1922, by Mr. J. Sonan.

Hitherto unrecorded from Formosa.

This species differs from *A. styracicola* Takah. in the characters as follows;

(1) Antennae more stout.

(2) The 5th antennal joint slightly longer than the 4th.

(3) Anal plate bilobed.

Astegopteryx fici n. sp.

(Pl. VI, B, figs. 10—13)

Winged viviparous female.

Black. Eyes, antannae, thorax and cauda black. Legs almost black. Wings slighty dusky; stigma pale gray; subcosta l lack; veins brownish.

Body wide, without wax-plates. Head small, lacking horns. Eyes large, with small ocular tubercles. Antennae short, the 3rd joint provided with 29, the 4th 7—9, the 5th 3 sensoria; the relative length of joints as follows: III—70. IV—19, V—11. Rostrum very short, not reaching the middle coxae. Fore wings with the 3rd oblique once forked; the 1st and 2nd obliques not united at their bases, subcosta provided with about 6 sensoria distributed over the whole length; hind wings with 2 shightly divergent obliques; hookles 2 or 3. Abdomen provided with a few long stout hairs near the sides. Spiracles slightly protuberant Cornicles reduced almost to pores. Cauda somewhat constricted at the base, wider than long. Anal plate bilobed. Legs provided with some bristles; tarsi short.

Length of body—1.8 mm. Antenna—0.95 mm.

Fore wing—2.3 mm.

Hosts.—*Ficus retusa; Ficus wichtiana.*

Distribution.—Formosa: Taihoku, Toyen, Koheki.

The winged forms are very rare, appearing from January to March.

The wingless forms are aleyrodiform, cemented to the leaf, and provided with some white wax on the margin of the body.

In my opinion *Thoracaphis* v. d. Goot is the wingless form of *Astegopteryx*.

Paracletus cynodonti (Das)

(Pl. VI, B, figs. 6—8).

Pemphigus? cynodonti, Das, Mem. Indian Mus., vi, p. 153 (1918).

Paracletus cynodonti, Takahashi, Aphididae of Formosa.—1, p. 97 (1921).

Winged viviparous female.

Yellow. Head, eyes, antennae and thorax black. Legs black, paler at the boses of femora. Wing-veins and stigma gray.

Body soft, lacking hairs. Head divided. Eyes large, outstanding, with very small ocular tubercles. Antennae somewhat imbricated, lacking hairs; the 3rd joint provided with about 7 very large oval or circular sensoria in a row over the whole length; the 4th 1—3 similar sensoria; the 5th only a large apical one; primary sensoria of the 6th provided with hairs; the relative length of joints as follows: I—7, II—10, III—23, IV—11, V—13, VI—22 (14+8). Rostrum very short, not reaching the middle coxae.

Metanotum provided with a pair of wax-plates. Wings ample; stigma wide; the 1st and 2nd obliques almost united at their bases; the 3rd not forked; subcosta provided with about 3 minute sensoria at the base and about 6 similar ones on the distal half. Each of the first five abdominal segments provided with 6 groups of wax-plates arranged transversely on the dorsum, the 6th and 7th with 4 groups, and the 8th 2.

Cornicles absent. Spiracles somewhat protuberant. The 2nd tarsal joint long and slender, a little shorter than the 3rd antennal joint.

Leagth of body—about 1.7 mm. Antenna—0.6 mm.

Host.—*Oplismenus sp.*, attacking the leaf.

Distribution: Formosa: Taihoku, Urai.
India.

Forda species.

Wingless viviparous female.

Yellowish green. Head, eyes, antennae, and legs dusky or pale gray.

Body oval, soft, lacking hairs. Head rather small. Eyes composed of three facets. Antennae very short, 5—jointed, lacking hairs; apical sensorium of the 4th joint almost circular and of medium size; the 5th joint somewhat imbricated; the relative length of joints as follows: I—7, II—9, III—13, IV—6, V—18. Rostrum not reaching the middle coxae. Wax plates not well developed. Cornicles absent. Cauda very short, broadly rounded. Legs slender, provided with a few very short hairs; hind tarsi almost as long

as the 5th antennal joint.

Length of body—about 2.0 mm. Antenna—about 0.38 mm.

Host plant.—*Salvia anthemifolia* R. BC. attacking the root.

Distribution.—Formosa: Taihoku.

Many wingless forms were collected by Mr. H. Sueta on April 9, 1922, near Taihoku.

The genus *Forda* is new to Japan and Formosa.

Descriptions of some new or little-known Japanese Aphididæ.

Akkaia polygoni Takah.

(Pl. III, A, figs. 2—4)

Insect World, Gifu, Japan, xxiii, No. 268, p. 440. (1919).

Wingless viviparous female.

Yellow or orange-yellow. Antennæ and legs pale yellow. Eyes red. Cornicles, cauda and anal plate concolorous with the body. Body oblong, rather depressed, broadest at midlength of the abdomen, without hairs. Frontal tubercles very large, almost as long as the 2nd antennal joint, with a prominent tubercle on the inner side, which is almost as long as the 2nd antennal joint, slightly curved towards the antenna, rounded at the apex, provided with a few very short, slightly knobbed setæ. Antennæ very short, 5-jointed, somewhat imbricated, without hairs; the 1st joint much larger than the 2nd, imbricated, with a short, stout blunt tubercle on the inner side; the 3rd lacking sensoria; the relative length of joints as follows: III—51, VI—15, V—26 (14+12). Rostrum reacking the middle coxæ. Abdomen not reticulated on the dorsum, lacking lateral tubercles; the 7th segment with a pair of very small blunt tubercles at the middle of the dorsum, the 8th segment with a small tubercle at the middle of the dorsum, this is a little longer than those on the 7th segment. Cornicles very large, projecting horizontally backwards beyond the caudal apex, somewhat imbricated and curved, brodest near the base, gradually tapering, norrowest at the tip; almost as long as the 3rd, 4th and 5th antennal joints together, about 3.5 times as long as the cauda. Cauda somewhat knobbed, with 2 pairs of short lateral bristles. Anal plate very large, projecting, reaching the middle or beyond the tip of the cauda. Legs slender, with some rather short setæ, tarsi normal.

Length of body—1.9 mm. Antenna—0.65 mm.

Cornicle—0.5 mm.

Host—*Polygonum thumbergii?*

Distribution.—Japan: Tokyo (Meguro).

This aphis is not uncommon near Tokyo in June and July, sometimes

occurring in abundance on the upper surface of the leaves and the stalks.

The winged forms are quite rare, having never been observed.

Aphis sambuci L.

Linne, Syst. Nat. I, II, p. 734 (1767); Kaltenbach, Mono. Pflanzl. p. 83 (1843); Koch, Die Pflanzl. p. 83, figs. 111—112 (1877); Buckton, Monog. Br. Aphid. ii, p. 99, pl. LXX, figs. 1—4 (1877); Kessler, Nova Acta der Ksl. Leop.—Carol. Dentschen Akd. Nat. XLVII, 3, p. 135 (1884); Mordvilko, Biol. Centralbl. p. 811 (1907); Matsumura, Jl. Coll. Agr. Sapporo, Japan, vii, 6, p. 358 (1917); Takahashi, Trans. Sapporo Nat. Hist. Soc. vii, 2. p. 199 (1919) and Zool. Mag. Tokyo, xxxii, No. 380, p. 197 (1920).

syn. *Aphis sambucifoliæ*, Fitch, Cat. Homop. N. Y., p. 66 (1855); Thomas, Illinois, St. Lab. Nat. Hist. Bull. 2, p. 13 (1878); Sanborn, Kansas Univ. Sc. Bull. 3, p. 52 (1904); Swain, Univ. Calif. Pub. Bull. iii, i, p. 123 (1919).

Wingless viviparous female.

Blackish green. Eyes, cornicles and cauda black. Antennæ black, slightly paler at the base of the 3rd joint. Legs black, paler at the bases of femora. Head provided with some moderately or rather long fine hairs. Frontal tubercles absent. Antennæ stout, imbricated, with some long fine hairs; the 3rd joint without sensoria; the relative length of joints almost as follows: III—54, IV—35, V—32, VI–57 (17+40). Rostrum reaching the middle coxæ. Prothorax with a large, stout blunt tubercle on each side, abdomen with 5 rather large blunt lateral tubercles which are smaller than those on the thorax. Abdominal segments provided with some short hairs on the dorsum. Cornicles cylindrical, very long and slender, imbricated, almost twice as long as the antennal spur, reaching the apex of the cauda, somewhat dilated towards the base, slightly curved, thrice as long as the cauda. Cauda stout, with many long hairs. Gonapophyses 4. Legs stout, provided with many long fine hairs.

Length of body—2.8 mm. Antenna—1.5 mm.

Cornicle—0.6 mm.

Winged viviparous female.

Head, eyes, mesothorax, cornicles and cauda black. Antennæ black, paler at the base of the 3rd joint. Prothorax and abdomen blackish green. Legs almost black, paler at the bases of the fore femora. Wings hyaline; stigma and veins gray. Head provided with some rather long fine hairs. Antennæ stout, imbricated, provided with some long fine hairs; the 3rd joint provided with 26—30 large or small circular sensoria scattered over the whole length; the 4th with 12—14, the 5th 3, similar sensoria; the relative length of joints as follows: III—35, IV—26, V—23, VI—50 (13+37). Rostrum reaching the middle coxæ. Prothorax with a large, stout, blunt lateral tubercle, abdomen with 5 similar, but smaller, tubercles on each side, those on the 1st segment largest. Wing-veins normal; hind wings with 2 almost parallel obliques; hooklets 4. Cornicles cylindrical, slender, shorter than those of the wingless form, almost as long as the spur of the last antennal joint.

Length of body—2.5 mm. Antenna—1.6 mm.
Fore wing—2.8 mm. Cornicle—0.45 mm.
Hosts.—*Sambucus racemosa*; *Sambucus thunbergiana*.
Distribution.—Japan: Tokyo; Sapporo.
Europe; North America.

In *Aphis sambuci*, the winged forms usually appear in the 2nd, 3rd, 4th and 5th generations and the sexuparæ, the males being also winged. As is well known, almost all aphids occasionally show some abnormality of wing-venation. In my experience with this species the abnormal forms occur in about 16 per cent in the wild specimens of the 2nd generation, in 75 per cent in the sexuparæ, etc. The data concerning these points are given in the following table:

	Normal	Abnormal	Percentage of abnormal
2nd generation	85	19	16%
3rd „	22	3	12%
4th „	16	2	11%
Sexuparæ	11	30	75%
Males	40	4	9%

The sexuparæ show a greater tendency to be abnormal than do the females of other generations and the males.

These insects are not good fliers; the sexuparæ, especially, do not fly as a rule, and the wings are not used in flight, the veins consequently tending to degenerate.

The majority of the abnormalities are in the 3rd oblique on the fore wings as is common in other plant-lice.

These observations were made near Tokyo during 1919.

Aphis horii n. sp.

(Pl. V, A, figs, 7—8 & Pl. V, B, fig. 4)

Wingless viviparous female.

Dark green. Head, antennæ, cornicles, cauda, anal plate and legs almost black. Eyes brown. Thorax with black spots and patches on the dorsum. Abdomen with 2 black bands behind the cornicles. Body broad, with some short hairs. Head provided with many moderately long fine hairs. Antennæ short, stout, imbricated, provided with moderately long fine hairs; the 3rd joint lacking sensoria; the relative length of joints as follows: III—62, IV—46, V—39, VI—66 (22+44). Rostrum reaching beyond the middle coxæ. Prothorax with a large lateral tubercle which is short, stout, rounded, and larger than those on the abdomen. Abdomen with 7 small rounded lateral tubercles on each side, of which those on the 7th segment are the largest. Cornicles very long and slender, distinctly curved, moderately dilated towards the base, imbricated, much longer than the 3rd antennal joint, reaching the apex of the cauda and more than 3 times as long as the cauda. Cauda stout, provided with many long fine hairs. Legs stout, provided with many long fine hairs.

Length of body—3.0 mm. Antenna—1.5 mm.
Cornicle—0.7 mm.

Winged viviparous female.

Dark green. Head, eyes, antennæ, thorax, cornicles, cauda and legs black. Abdomen with some short black bands on the middle of the dorsum and some small black patches on the sides. Wings hyaline; veins and stigma brown.

Body almost without hairs. Frontal tubercles very short. Antennae short and stout, imbricated, provided with many moderately long fine hairs; sensoria circular, rather large, scattered over the whole length, the number as follows: III—35, IV—15....17, V—7....8+1, VI—1+3; the relative length of joints as follows: III—55, IV—41, V—33, VI—68 (18+50). Rostrum reaching a little beyond the middle coxae. Tubercles on the side of the body as in the wingless form. Cornicles long and slender, cylindrical, slightly tapering, not curved, imbricated, as long as the 3rd antennal joint, almost reaching the apex of the cauda, about 3 times as long as the cauda. Cauda stout, wider than the cornicle, provided with many long fine hairs. Wings normal; obliques on the hind wings parallel; hooklets 4. Legs long and stout, provided with numerous rather fine hairs.

Length of body—2.7 mm. Antenna—1.6 mm.
Cornicle—0.5 mm. Fore wing—3.4 mm.
Host.—*Cirsium dipsacalepsis.*
Distribution.—Japan (Sapporo).
Collected by Mr. M. Hori.

Myzocallis arundinariae Essig.

Univ. Calif. Publ. Entom. 1, pp. 302—305 (1917).

Winged viviparous female.

Green. Antennae black or brownish black. Wings very narrowly clouded along the 1st and 2nd obliques; veins yellowish brown or blackish; stigma pale brown. Tubercles on the dorsum blackish. Cornicles and cauda slightly dusky. (Described from specimens preserved in alcohol). Body rather narrow, without hairs. Frontal tubercles absent. Antennae very long and shender, without hairs; the 3rd joint slightly imbricated on the distal half, provided with 5—8 oval sensoria of medium or rather small size in a single row near the base; the 4th imbricated, lacking, sensoria; the relative length of joints as follows: III—80, IV—55, V—50, VI—64 (30+34). Head with a short tubercle on the underside. Rostrum not reaching the middle coxae. The 1st oblique of fore wings almost straight; the 2nd somewhat curved; hind wings with 2 slightly divergent obliques; hooklets 3. Abdomen on the middle of the dorsum with 6 pairs of very small blunt tubercles, which are subequal in size,

and 5 very small blunt tubercles in front of the cornicle. Cornicles a little longer than wide, somewhat constricted about midlength. Cauda globular, a little wider than each lobe of the anal plate, which is deeply bilobed. Legs very long and slender, provided with numerous moderately or rather long bristles on the distal half of the tibia.

Length of body—1.9 mm. Antenna—2.65 mm.
Fore wing—2.5 mm.
Host—*Bambusa sp.*
Distributoin.—Japan: Shikoku (Uwajima).
North America.
Hitherto unrecorded from Japan.
Collected by Mr. S. Kuwayama in March 1919.

Myzocallis yokoyamai n. sp.

(Pl. III, A, figs. 5—2)

Winged viviparous female.

Green. Head yellowish green, slightly dusky. Eyes almost white. Rostrum pale yellow, with the tip black. Antennae pale yellowish, with the apices of the joints black. Mesothorax brownish. Dorsal tubercles on the thorax green. Abdomen provided with 3 pairs of finger-like tubercles, of which the first is green and the other two are black. Cornicles and cauda almost pale yellowish green. Wings along the 1st and 2nd obliques slightly clouded; veins pale brown, blackish at the bases of the obliques; stigma dusky. Fore femora almost colourless, but the middle femora pale green, slightly dusky at midlength, and the hind pair black, with the bases pale green and the apices paler; tibiae pale brownish; tarsi black. Body oblong. Head provided with 2 pairs of very long capitate hairs arising from small tubercles between the antenna a pair of short similar hairs behind these long ones, and 4 very short similar ones araanged in a transverse row near the hind margin. Frontal tubercles very short. Eyes large, protuberant.

Antennae slender, provided with a few very short capitate hairs; the 1st joint shorter than the longer capitate hairs on the head; the 3rd somewhat imbricated on the apical portion, provided with 8 or 9 circular sensoria of

Winged viviparous female.

Black, somewhat purplish. Eyes reddish brown. Antennae mostly white, with the apices of joints black. Rostrum pale green. Cornicles and tubercles black. Cauda pale brown. Fore and middle femora slightly pale greenish, the tibiae pale brown, with the apices darker; hind legs black, with the apices of tibiae brown. Body oblong, provided with many moderately and rather long normal bristles. Head provided with 3 pairs of very long bristles arising from small tubercles on the front, a bristle at the base of the frontal tubercle, and 4 moderately long bristles aranged in a transverse row between the eyes. Frontal tubercles distinct. Eyes prominently protuberant. Antennae very long and slender; the 1st joint somewhat convex on the inner side, which is provided with a long stout capitate hair arising from a small tubercle and a few normal bristles; the 2nd provided with a capitate hair arising from a small tubercle on the inner side; the 3rd provided with 8—10 circular sensoria of medium size in a single row, mostly on the basal half, with about 9 rather long stout capitate hairs; the 4th somewhat striate, lacking sensoria, with about 5 bristles; the 5th somewhat imbricated, with 3 bristles; the relative length of joints as follows: III—93, IV—52, V—44, VI—50 (19+31). Rostrum reaching a little beyond the front margin of the mesothorax. Pronotum provided with a group of some protruding sensoria, wdich are circular, on each side. Abdomen with 3 pairs of finger-like tubercles on the middle of the dorsum at the base, of which the 1st is the smallest, the 3rd very large; these tubercles imbricated, provided with 2—3 short bristles; basal 5 abdominal segments each with a short blunt tubercle on the side, of which those on the 4th segment are the largest, but shorter than the dorsal tubercles on the 2nd segment. Cornicles much longer than wide, expanded at the base, slightly constricted about midlength, striate, a little longer than the lateral tubercle on the 4th abdominal segment. Cauda globular, with some long bristles. Anal plate deeply bilobed, each lobe as wide as the cauda. Legs very long and slender, provided with numerous very long bristles. Wings normal; obliques on the hind wing divergent; hooklets 2.

Lenghth of body—2.7 mm. Antenna—2.6 mm.

Fore wing—3.0 mm.

Hosts.—*Quercus dentata; Quercus glandulifera.*

medium or rather large size in a single row on the basal four-fifths; the 4th lacking sensoria; the relative length of joints as follows: III—104, IV—58, V—52, VI—68 (26+42). Rostrum not reaching the middle coxae. Pronotum provided with some short capitate hairs, and a pair of moderately large finger-like tubercles at the middle of the dorsum, which are furnished with 2 long capitate hairs. Mesothorax provided with many moderately long or rather short capitate hairs. Subcosta of the front wing lacking sensoria; stigma furnished with a few very short hairs in one row near the hind margin; the 1st oblique of the front wing almost straight; the 2nd straight or somewhat sinuated; the 3rd normal. Abdomen provided with 3 pairs of large finger-like tubercles, which are subequal in size and are armed with 2 or 3 capitate hairs, at the middle of the dorsum near the base, some very small blunt tubercles on the sides, and some long and short bristles.

Cornicles very slightly constricted about midlength, broadest at the base, almost twice as long as wide at the middle. Cauda globular, almost as long as the lobe of the anal plate, provided with some long bristles. Anal plate moderately bilobed, with many long bristles, Legs slender, provided with many rather long bristles, some of which are knobbed.

Length of body—about 2.2 mm. Antenna—2.1 mm.

Fore wing—about 3.0 mm.

Hosts.—*Quercus species.*

Distribution.—Japan (Tokyo, Takao).

This species is closely related to some *Myzocallis* described by Dr. Matsumura, and it may possibly be a synonym of one of his species.

Near Tokyo the eggs hatch in the middle of April, the adults of the first generation appearing at the beginning of May.

All the viviparous females of each generation are winged as is common for the Callipterina.

Collected by Mr. K. Yokoyama and the author.

Myzocallis quercicola (Mats.)

(Pl. II, B, fig. 1)

Acanthocallis quercicola, Matsumura, Jour. Agr. Coll. Sapporo, vii, pt. 6, p. 368 (1917).

Distribution.—Japan: Tokyo, Sapporo.

Collected by Mr. K. Yokoyama and the author.

This aphis is very common near Tokyo. The eggs hatch in the middle of April, and the viviparous females are always winged. The sexual forms occur in November. The males are winged, but the oviparous females are wingless as is common among plant-lice.

Drepanphis tokyoensis n. sp.

(Pl. VI, A, figs. 5—10)

Winged viviparous female.

Green. Wings clouded with fuscous, paler at the base. Body oblong, lacking wax. Head provided with a few rather long normal bristles, arising from very small tubercles. Frontal tubercles distinct, but not large, straight on the inner side. Eyes large, with prominent ocular tubercles. Antennae very long and slender, almost lacking hairs; the 1st joint much larger than the 2nd, somewhat angulated on the inner side; the 3rd somewhat imbricated, provided with 8—10 transversely narrowed sensoria of medium or rather large size in a row at the base; the 4th imbricated, lacking sensoria; the relative length of joints as follows: III—96, IV—82, V—83, VI—100 (39+61). Rostrum not reaching the middle coxae. Thorax and abdomen provided with some long stout bristles, arising from very small tubercles, lacking larger tubercles. Wings rather narrow; the 3rd oblique twice forked, stigmatic vein not obsolete, slightly curved, stigma wide, brovided with 2 or 3 sensoria near the base; hind wings with 2 parallel obliques; hooklets 3 or 4. Cornicles large, stout, about 1.8 times as long as the cauda, often moderately swollen about the middle, narrowed on the distal portion and at the base, sometimes not narrowed at the base, somewhat curved, somewhat imbricated, about 2.5 times as long as wide.

Cauda constricted at midlength, with the distal half almost globular, provided with 3 pairs of lateral bristles. Anal plate hardly indented. Legs provided with numerous short hairs; front femora very stout, tarsi normal.

Length of body—about 1.7 mm. Antenna—about 2.4 mm.

Fore wing—about 2.7 mm.

Host—*Acer sp.*, attacking the leaf.

Distribution.—Japan: Tokyo (Mitoshirocho, Kanda)

Collected by the author in August, 1918.

Astegopteryx japonica n. sp.

Winged viviparous female.

Pink. Body oblong, without hairs. Head without hornlets. Eyes very large, with small ocular tubercles. Antennae short, striate; the 3rd joint provided with 14—16 annulations, regularly arranged; the 4th with 4—6 similar sensoria; the 5th with 4 similar sensoria; the relative length of joints as follows: III—30, IV—15, V—19. Rostrum reaching beyond the middle coxae. The 1st and 2nd obliques of the fore wing almost united at their bases; the 2nd slightly curved; the 3rd once branched, obsolete at the base; subcosta provided with 4 or 5 very minute sensoria in a single row on the distal half; stigma lacking sensoria; hind wings with 2 somewhat divergent obliques; hooklets 2. Cornicles typical. Cauda constricted at the base, with some long bristles. Anal plate bilobed. Legs provided with some moderately long fine hairs; hind tarsi almost as long as the 4th antennal joint, with 2 very long capitate fine hairs.

Length of body—about 1.5 mm. Antenna—0.47 mm.

Fore wing—2.3 mm.

Host.—*Ranunculus sp.??*, not producing galls.

Distribution.—Japan: Tokyo (Ikegami)

Collected by the author on the leaves of the host on July 1, 1919.

Eutrichosiphum pasaniae (Okaj.)

Trichosiphum pasaniae, Okajima, Bull. Agr. Coll., Tokyo Imp. Univ. viii 1, p. 5 (1908).

Eutrichosiphum pasaniae, Essig and Kuwana, Proc. California Acad. Sc. 4th ser, viii, 3, p. 97 (1918).

Hosts—*Pasania cuspidata*, *Quercus spp.*

Distribution.—Japan: Tokyo. Loochoo: Iriomote.

Mr. Sonan collected some wingless viviparous females in the island, Iriomote, Loochoo, on March 30, 1922.

Hitherto unercorded from Loochoo.

The specimens from Loochoo exactly agree with those from Japan.

Field observations on some Aphididæ in Formosa and Japan.

The observations of the following pages were made by the author near Tokyo from 1916 to 1920 and near Taihoku from 1920—1922.

Macrosiphum gobonis Mats.

(Host plants)

Arctium lappa: only the under sufaces of the leaves are attacked, the injury not being severe. In Japan this species often occurs in very large numbers on this plant, but, in Formosa, it is quite rare.

Cirsium joponicum: the stems are infested. Near Taihoku this insect may be seen on this host from November to June, most abundantly from January to April, while near Tokyo, it is not uncommon on the host from April to October.

Crepis joponica: a few wingless viviparous females were found attacking the stem in March 1921, near Taihoku.

Saussurea affinis: the stems are attacked. I have observed many winged and wingless viviparous females in March and April, 1921, and in April, 1922, near Taihoku.

(Season when the insect is abundant)

In Formosa this louse is abundant from January to April and is extremely rare from July to October, while near Tokyo it is very common from April to October.

(Winged viviparous female).

The winged viviparous females are very common in Formosa, as well as in Japan.

(Male and oviparous female)

In Formosa this aphis is viviparous throughout the year, without producing the sexual forms, which, in the vicinity of Tokyo, occur from the beginning of November.

(Intermediate)

Only a brachypterous viviparous female has been collected by the author in December, 1917, near Tokyo.

(Some notes on the life history near Tokyo)

Near Tokyo the females of the 1st generation (stem-mothers), which appear about the middle of April, are always wingless, as is common in many species of plant-lice, but those of each of the 2nd and subsequent generations are winged or wingless. Whether the sexuparæ are winged or wingless has never been determined. The winged males and wingless oviparous females occur on the *Cirsium japonicum* from the 1st week of November on. The eggs have a greenish colour when newly laid, gradually darkening to a deep black. Some individuals feeding on the *Arctium lappa* are viviparous throughout the winter, but others on the same plant sometimes produce the sexuales as late as December.

(Habits)

This aphis has the habit of directing the head downwards when resting on the host. The wingless viviparous females, when disturbed, sometimes secrete a reddish yellow fluid from the cornicles.

(Communal life)

Macrosiphum gobonis and *Macrosiphum cirsicola* Takah. are sometimes found in groups on *Cirsium joponicum* in Japan, as well as in Formosa. They are not tended by ants.

(Distribution).

Formosa: Kiirun, Shirin, Taihoku, Shinten, Urai, Maruyama, Kagi.

Japan: Tokyo, Chiba, Saitama, Sapporo, etc.

Macrosiphum ibotum Essig et Kuw,

(Pl. IV, A, figs. 5—10)

Host plant,—*Ligustrum ibota*, attacking the lower surface of the leaf.

Some wingless viviparous females which were probably sexuparæ, wingless oviparous females, and winged males were collected on November 29, 1919, near Tokyo.

Oviparous female: yellow; wingless; antennæ provided with a rather small sensorium near the base of the 3rd joint; hind tibiæ provided with numerous rather small circular sensoria scattered almost over the whole length, cornicles imbricated, not reticulated.

Male: winged; antennæ provided with many circular sensoria; cornicles not reticulated.

Distribution.—Japan: Tokyo (Meguro).

Macrosiphum rosæ (L.)

(Host plants)

Rosa spp., attacking the young shoot and the bud.

Some wingless viviparous females of an aphid, which were collected on *Rulus sp.* on March 23, 1921, at Kwanshirei, Formosa, seem to belong to this species.

(Season when the insect is common)

Near Taihoku, this aphis may be seen commonly almost at any season, but it rarely occurs in large numbers.

(Winged viviparous female)

The winged forms are common in Formosa, as in Japan.

(Male and oviparous female)

It is viviparous all the year in Farmosa, as well as near Tokyo, the sexuales having never been observed. The author has observed in Hokkaido a female producing young on a *Rosa* that was covered with snow.

(Intermediate)

I have never found any intermediates.

(Communal life)

Not attended by ants.

(Distribution)

Formosa: Taihoku, Kagi.

Japan: Tokyo, Sapporo, etc.

Macrosiphum cirsicola Takah.

(Host plant)

Cirsium japonicum: the stems are attacked. The young numphs sometimes feed on the flowers.

(Observations near Taihoku)

This aphis is very rare and does not occur in large numbers. The

author has observed a few wingless and winged viviparous females only in the months of February, March, April, and May.

(Observations near Tokyo)

This species is rather rare, usually occurring in small numbers, but it may be seen from June to November. The winged males were observed in the 1st week of November, 1919, at Meguro, Tokyo.

(Intermediate)

No intermediates have been observed.

(Habits)

Resting on the host, with the head directed downwards. The viviparous females sometimes secrete a yellow fluid from the cornicles when disturbed.

(Communal life)

This aphis is almost always found in the colonies of *Macrosiphum gobonis* Mats. Not attended by ants.

(Distribution)

Formosa: Taihoku.

Japan: Tokyo, Sapporo.

Macrosiphum ambrosiæ Thomas.

Host plant.—*Gnaphalium multiceps*, attacking the stem.

Only a few wingless viviparous females were observed on March 22, 1921, at Kwanshirei, Formosa.

Macrosiphum smilacifoliæ Takah.

(Pl. I, A, figs. 3—4)

Host plant.—*Smilax chinensis*, attacking the under surface of the young leaf.

Only a wingless viviparous female was observed on March 12, 1921, but many were found on April 17, 1922. The aphis drops to the ground when slightly disturbed.

Distribution.—Formosa: Taihoku.

Macrosiphum debilis Takah.

Host plant.—*Lactuca debilis*, attacking the stem.

This aphis seems to be rather rare, since the author has observed some wingless viviparous females on March 11, wingless and winged individuals on October 15, 1921, and some wingless forms on February 25, 1922, near Taihoku.

This aphis and *Amphorophora oleraceæ* (v. d. Goot) are sometimes found together.

Macrosiphum pæderiæ Takah.

(Host plant)

Pæderia tomentosa: the leaves and the stems are attacked. The aphis feeds only on this plant.

(Season when the aphis is abundant)

The aphis is common, sometimes occurring in abundance in Formosa, as well as, near Tokyo.

(Winged viviparous female)

The winged viviparous females are very common at any season in Formosa, but near Tokyo I have observed them only from May to July.

(Male and oviparous female)

In Formosa this aphis is continuously viviparous even in the winter, never producing sexual forms. Near Tokyo, however, the winged males and wingless oviparous females make their appearance at the last of October. The females outnumber the males as is common in the Aphididæ. The sexuparæ are not provided with wings.

(Intermediate)

No intermediates have been observed.

(Distribution)

Formosa: Taihoku, Shirin, Shinten, Kagi.

Japan: Tokyo,

Macrosiphum granarium Kirby.

(Host plants)

In Formosa this aphis has been found on *Miscanthus sp.* and *Oryza sativa?*

Near Tokyo it was observed on *Hordeum sativum, Triticum vulgare* and some plants of the Gramineæ.

(Season when the aphis is abundant)

Near Taihoku this insect is extremely rare at any season, but near Tokyo it occurs in great abundance from the beginning of May to the end of July and is extremely rare in other months.

(Winged viviparous female)

Very common near Tokyo.

(Male and oviparous female)

The author has never observed the sexual forms.

(Colour variation)

Near Tokyo many reddish brown individuals may be found from May to July.

(Distribution)

Japan: Tokyo, Sapporo, etc.

Formosa: Taihoku.

Macrosiphum formosanum Takah.

(Host plants)

Lactuca brevirostris, L. debilis, L. formosana, L. scariola, L. gracilis, Sonchus oleraceus: the stalks and the lower surfaces of the leaves, chiefly along the midribs, are attacked.

Taraxacum platyearpum: some wingless viviporous females were observed on April 30, 1922, at Tansui, Formosa.

(Season when the insect is common)

Near Taihoku this species is quite common all the year, occasionally occurring in abundance.

(Winged viviparous female)

The winged forms are very common, appearing in almost every viviparous

generation near Taihoku, as well as near Tokyo.

(Male and oviparous female)

Near Taihoku it is continuously viviparous throughout the year and no sexes have been observed, but near Tokyo the winged males and wingless oviparous females occur from the last part of October and may be seen until as late as the last of November.

(Intermediate).

The brachypterous forms are extremely rare as in other *Macrosiphum*, only one having been observed on September 7, 1920 near Taihoku. But, when the winged viviparous females are parasited by a species of Chalcididæ in the second or third nymphal instar, their wings often fail to expand, although developing as normal wings up to the last nymphal stage, and they become brachypterous forms, which do not differ in structural characters from the normal winged ones except in the abnormal wings.

(Habit)

The aphis directs the head downwards when at rest, moves the abdomen from side to side when approached, and drops to the ground when disturbed, like many other species of *Macrosiphum*.

(Distribution)

Formosa: Kiirun, Tansui, Sozan, Taihoku, Shirin, Urai, Kagi, Kwanshirei.

Japan: Tokyo.

Macrosiphum neoartemisiæ Takah.

(Pl. VI, B, fig. 1)

(Host plant)

Artemisia capillaris: the distal portions of the stalks are attacked. This aphis spends the entire life on this plant, not alternating the host.

(Season when the species is common)

Near Taihoku this aphis is rather common at all seasons, but usually does not occur in abundance.

(Winged viviparous female)

The winged forms appear at any season, but are very few in number.

(Male and oviparous female)

It is viviparous all the year like most Aphididæ in Formosa, and no sexes have been observed.

(Intermediate)

No intermediates have been found.

(Colour variation)

Some yellowish wingless individuals were noticed in August, 1921.

(Habit)

It has the habit, even when slightly disturbed, of dropping to the ground. The head is directed downwards when at rest.

(Communal life)

This species and *Macrosiphoniella formosartemisiæ* Takah. or *Cerosipha sp.* are sometimes found in groups on the host. Not attended by ants.

(Distribution)

Formosa: Taihoku, Shirin.

Macrosiphoniella citricola van der Goot.

(Pl. I, A, figs. 5—7 & Pl. II, A, fig. 5)

(Host plants)

Lasianthus specis: the lower surfaces of the leaves and young shoots are attacked, the infested leaves being curled. The author observed on this plant, some wingless and winged viviparous females on April 3, 1921, at Urai, and a few wingless ones on July 18, 1921, at Kappanzan, Formosa.

Cinnamomum camphora: the lower surfaces of the young leaves are attacked; the infested leaves do not curl. Some wingless viviparous females were observed on this plant on March 3, 1922, at Taihoku.

Ficus obscura: one wingless form was found on the lower side of a young leaf on April 17, 1922, at Taihoku.

Bridelia ovata: many wingless and a few winged viviparous females were observed on the young shoots and the under surface of the leaves on April 3, 1922, at Maruyama, near Taihoku.

Murraya exotica: a few wingless viviparous females were found on the young leaves on April 21, 1922, at Taihoku.

In Formosa this aphis has never been collected on *Citrus*.

(Male and oviparous female)

This species is probably viviparous all the year, without producing the sexuales, as in most Aphididæ in Formosa.

(Distribution)

Formosa: Taihoku, Urai, Kappanzan.

Macrosiphoniella sanborni (Gillette).

Host plants.—*Chrysanthemum spp.*

This aphis seems to be rather rare in Formosa, since I have observed some wingless viviparous females only on April 19 and July 6, 1920, and on February 14, 1921, near Taihoku.

Macrosiphoniella formosartemisiæ Takah.

(Pl. II, A, figs. 1—3).

(Host plant)

Artemisia capillaris: the stalks are attacked.

(Season when the species is common)

The viviparous females are very common on this plant, throughout the year, occasionally occurring in large numbers at any season.

(Winged viviparous female)

The winged forms are produced not uncommonly at any season.

(Male and oviparous female)

This aphis is continuously viviparous through the year near Taihok, and no sexes have been found.

(Intermediate)

No intermediates have been observed.

(Habit)

The females direct the heads downwards when at rest and drop to the ground when disturbed.

(Communal life)

The species and *Macrosiphum neoartemisiæ* Takah. are sometimes found together in groups on the *Artemisia capillaris*.

(Distribution)

Formosa; Taihoku, Kagi, Giran.

Macrosiphoniella tanacetarium (Koch)

(Host plant)

Artemisia vulgaris, var. *indica :* the distal parts of the stalks are attacked.

(Season when the iusect is common)

Near Taihoku this species is very rare, occurring in very small numbers. A few wingless viviparous females were observed on June 26, 1920, and April 3 and October 3, 1921, near Taihoku. Near Tokyo the wingless viviparous female may be seen not uncommonly from the beginning of August to the flrst week of October, during which period no winged forms have been observed.

(Winged viviparous female)

Near Taihoku I have never observed any winged forms. Near Tokyo winged ones occur in the fall, which are probably sexuparæ.

(Male and oviparous female)

Near Taihoku this aphis seems to be continuously viviparous all the year, but near Tokyo a few winged males and many wingless oviparous females occur from the last of October. The sexuparæ seem to be wingless or winged.

(Intermediate)

No intermediates have been found.

(Distribution)

Formosa : Taihoku, Urai.

Japan : Tokyo.

Myzus formosanus Takah.

Host plant.—*Polygonum chinensis,* attacking the lower surface of the leaves. The infested leaves are rolled.

Some wingless viviparous females were observed on May 6, 1922 near Taihoku.

Myzus persicæ (Sulz)

(Host plants in Formosa)

Acer, species : a few nymphs of the wingless form were observed on the

lower surface of the leaf on February 26, 1921, near Taihoku.

Capsella bursa-pastoris : a few nymphs of the winged form on March 12, 1921, near Taihoku.

Chenopodium album : a few wingless viviparous females and nymphs of the winged form on January 27, 1921, near Taihoku.

Chrysanthemum, sp. : a few nymphs of the winged from on March 12, 1921, near Taihoku.

Brassica spp. : the lower surfaces of the leaves are attacked.

Duranta plumieri : the leaves are attacked. Numerous wingless and winged viviparous females in April, 1920, at Taihoku.

Hibiscus albomoschus : some wingless and winged viviparous females on January 25, 1922, near Taihoku.

Ipomœa batatas : a wingless viviparous female on December 6, 1920, at Tansui.

Lactuca oldhami : wingless viviparous females on March 25, 1921.

Nicotiana tabacum : numerous females on the stalks in March, at Kagi and Ako.

Papaver somniferum : numerous viviparous females in March, at Nanto, Mato, Kagi, etc.

Petasites tricholobus : a few wingless viviparous females on March 23, 1922, near Taihoku.

Pisum sativum : some wingless and winged forms on January 27, 1921, near Taihoku.

Prunus persica : some winged viviparous females on February 8, 1921, near Taihoku.

Psidium guyava : a numph on March 8, 1921, near Taihoku.

Rhaphanus sativus : the lower surfaces of the leaves are attacked.

Solanum melongena : wingless females on November 8, 1920, near Taihoku; a similar one on March 19, 1921, at Kagi. Some winged males and viviparous females were observed on March 21, 1922, near Taihoku.

Stellaria aquatica : a few nymphs on February 28, 1921, near Taihoku.

Allium scorodoprasum var *viviparum :* a few winged viviparous females were observed resting on this plant, without producing young, on October 1, 1921, at Shinten near Taihoku.

Myzus tropicalis Takah.

Host plant.—*Prunus persica.*

The lower surfaces of the leaves are attacked and the infested leaves are rolled.

This aphis is very common at Sozan, near Taihoku, where the author has observed the wingless and winged viviparous females on April 10 and the wingless ones only on June 17, September 25, and December 29, 1921. Many wingless ones were observed on the host on April 30, 1922, at Tansui. Formosa.

Myzus sasakii Mats.

Host plant.—*Prunus pseudo-cerasus.*

The wingless viviparous females of the first generation (stem-mothers) produce conspicuous galls along the ribs of the leaves (on the upper surface) of the host tree. The galls start about the middle of April, attaining their full growth and development toward the middle of May. In every gall there is one stem-mother.

The 2nd generation consists entirely of winged viviparous females which leave the *Prunus* about the middle of May and fly away in search of the summer host, which is as yet unknown. The stem-mothers are very inactive, being provided with very small eyes and very short antennae and cornicles.

Distribution.—Japan : Tokyo.

Myzus sakurae Mats.

Host plant.—*Prunus pseudo-cerasus.* The under surfaces of the young leavers are attacked and the infested leaves are rolled.

Near Tokyo the wingless viviparous females are present from about June to the last of September, during which period the winged viviparous females make their appearance rather commonly. This aphis and *Myzus persicae* (Suly.) are sometimes found in groups near Tokyo. Not attended by ants.

Of these plants the most favored hosts are *Duranta plumieri, Nicotiana tabacum, Brassica oleraceae, Rhaphanus sativus,* etc., on which plants the insect sometimes occurs in enomorous numbers, producing a conspicuous infestation.

(Season when the insect is common)

The species is one of the most common in Formosa where it is most abundant apparently in the winter or spring, its numbers being reduced during the summer.

(Winged viviparous female)

The winged forms are to be found at any season in Formosa, as well as in Japan.

(Male and oviparous female)

It is continuously viviparous all the year, usually without producing the sexes near Taihoku, as well as near Tokyo. However, a few winged males and their nymphs were found in a colony on *Solanum melongena* on Mach 21, 1922, near Taihoku, although no oviparous females were observed.

No reason for the occurrence of these male insects was found.

(Intermediate)

No intermediats have been found in Formosa.

(Communal life)

Myzus persicae (Sulz.) and *Aphis gossypii* Glove or *Rhopalosiphum pseudobrassicæ* (Davis) are sometimes found in groups. Not attended by ants.

(Distribution)

Formosa : Taihoku, Shirin, Tansui, Kiirun, Shinten, Ako, Nanto, Mato, Kagi.

Japan : Tokyo, Sapporo, etc.

Myzus momonis Mats ?

Host plant.—*Prunus persica.*

The lower surfaces of the leaves are attacked, and the infested leaves are rolled. Many wingless viviparous females were observed on July 17, 1921, at Kappanzan, Formosa.

Distribution.—Japan: Tokyo, etc.

Myzus woodwardiae Takah.

Host plants.—*Woodwardia radicans;* rarely found on *Polystichum sp.* The under surfaces of the tender leaves, espeically the midribs, are attacked. The aphis has the habit of directing the head downwards. Not attended by ants. This aphis may be seen only from February to April, being very rare. The author has observed some wingless viviparous females on April 19, 1920, wingless ones and nymphs of winged forms on Feberuary 12, numerous winged adults and some wingless ones on February 20, and some wingless ones on February 25, 1921, and a few wingless ones on February 8 and 16, a few wingless ones and many winged forms on March 26, and many wingless and winged ones on April 17, 1922, near Taihoku.

Distribution.—Formosa: Taihoku, Kwannonzan.

Myzus polypodicola Takah.

Host plant.—*Polystichum sp.* The under surfaces of the tender stalks are attacked.

This species is quite rare and does not occur in large numbers. A few wingless viviparous females collected in the months of April and May, 1920, and a few nymphs of winged forms in February, 1921, near Taihoku.

Distribution.—Formose: Taihoku.

Myzus hemerocallis Takah.

(Pl. VII, B, figs. 11—15)

Host plant.—*Hemerocallis fulva.* The basal portions of the tender leaves are attacked. Numerous wingless and winged viviparous females were found on March 15, 1921, near Taihoku. Not attended by ants.

Distribution.—Formosa: Taihoku.

Myzus arthraxonis Takah.

(Pl. I, A, figs. 1—2 & Pl. VII, B. figs. 7—8)

Host plant.—*Arthraxon ciliaris.* The under surfaces of the leaves are attacked. Some wingless viviparous females and a few winged ones were found on March 6, 1921, near Taihoku. Not attended by ants.

Capitophorus hippophaes (Koch).

Host plants.—*Polygonum lapathifolium* and *Polygonum hydropiper.*

The lower surfaces of the leaves are attacked and the infested leaves are slightly curled. Some wingless and winged viviparous females were observed on February 6 and May 20, 1922, near Taihoku. This aphis is very inactive and does not group densely. Not attended by ants.

Capitophorus formosartemisiae Takah.

(Pl. VII, B, figs. 9—10)

Host plant.—*Artemisia vulgaris* var. *indica.* The under surfaces of the leaves are attacked. A few wingles and winged viviparous females were found on March 13 and 15, 1921, near Taihoku. The species is very inactive in habit and is not attended by ants.

Trichosiphonaphis polygoniformosanus Takah.

Host plant.—*Polygonum perfoliatum.* The lower surfaces of the stalks and leaves are attacked. Some wingless viviparous females and nymphs of the winged form were observed on October 25, 1920, near Taihoku, and some wingless and a few winged ones on March 20, 1921, at Kagi, Formosa.

Trichosiphonaphis polygoniformosanus Takah?

An aphis feeding on the lower surface of the leaves and stalks of *Lonicera japonica* seems to be identical with *T. polygoniformosanus* Takah. feeding on the *Polygonum.* Near Taihoku the aphis is very rare on the *Lonicera,* some

wingless viviparous females having been observed on April 26, 1921. Near Tokyo, however, it is not uncommon at all seasons, although it usually does not ocur in abundance. The winged forms seem to be rather rare, since the author has observed them only on April 1, and November 10, 1918. Some colonies of the species on the *Lonicera* continue to be viviparous all the year, without producing the sexes even in the winter, but it some colonies on the same plant the winged males and wingless oviparous females occur at the beginning of December, near Tokyo. The eggs are blackish green in colour, and are placed upon the lower surface of the leaves.

Neophorodon rubi Takah.

Host plant.—*Rubus sp.* (*Rubus flaxinifolius?*) The lower surfaces of the tender leaves are attacked. The author has observed wingless and winged viviparous females in enomorous numbers on March 19, 1921, at Kagi, Formosa.

Phorodon humuli (Pass.)

Host plant.—*Humulus japonicus.*

This aphis is not common near Taihoku, and the author has observed some wingless viviparous females on the under sides of the leaves on March 5, 1921, at Shirin, near Taihoku. Near Tokyo, the wingless viviparous females are present on the *Humulus* from the beginning of June to the first week of October, sometimes occurring in large numbers, and during this period no winged forms are produced. The author has observed many winged forms producing nymphs on *Humulus* on May 28, 1918. The species is rather inactive and is not attended by ants.

Distribntion—Formosa: Shirin; Japan: Tokyo.

Amphorophora oleraceae (v. d. Goot).

(Pl. IV, B, figs. 2—3)

(Host plants)

Lactuca debilis; Sonchus oleraceus. The lower surface of the leaves and the stalks are attacked.

(Season when the insect is abundant)

The species is rather common from January to April, but is rare in other months.

(Winged viviparous female)

The winged forms are very common.

(Male and oviparous female)

This species is continuously viviparous throughout the year, without producing the sexual forms, near Taihoku.

(Intermediate)

No intermediates have been observed.

(Communal life)

This aphis and *Macrosiphum debilis* Takah. or *M. formosanum* Takah. are sometimes found in groups on *Lactuca* or on *Sonchus*. Not attended by ants.

(Habit)

This aphis has the habit, when disturbed, of dropping to the ground.

(Distribution)

Formosa: Taihoku, Kwannonzan near Taihoku.

Amphorophora sonchifoliae Takah.

Host plant.—*Sonchus arvensis.*

Some wingless and winged viviparous females were observed on the stalks and the under surface of the leaves on March 23, 1921, at Kwanshirei, Formosa.

Amphorophora species.

Host plant.—*Pollia japonica,* attacking the under surface of the leaves.

Some wingless viviparous females and nymphs of winged forms were observed on July 31, 1921, at Rimogan, near Urai, Formosa.

Amphorophora formosana Takah.

Host plant.—unknown.

Some wingless viviparous females were collected on March 19, 1921, at Kagi, Formosa.

Amphorophora magnoliae (Essig et Kuw.)

(Pl. VI, B, figs. 4—5)

Syn. *Rhopalosiphum magnoliae*, Essig and Kuwana, Proc. Calif. Acad. Sc. viii, 3, p. 59 (1918).

Rhopalosiphum sambucicola, Takahashi, Zool. Mag. Tokyo, xxx, p. 372 (1918) and Proc. Entom. Soc. Washington, xxi, 7, p. 176 (1919).

This aphis is one of the most common species near Tokyo, where no oviparous females are produced throughout the year, and the life history is very complicated. The fall migrants (pseudosexuparae) return to the winter host, *Sambucus racemosa*, during the months of October and November and produce the young upon the under surface of the leaves. Most of these young develop into wingless viviparous females, while a few acquire wings, remove again to other *Sambucus racemosa*, and produce wingless viviparous females. As the leaves of the winter host begin to fall, the lice locate themselves upon the lower side of the buds, where they survive the winter. The parthenogenetic reproduction, which consists of wingless forms, is carried on generation after generation during the winter, although reduced to a low rate. The aphis becomes extremely abundant in April, in which month the spring migrants (winged viviparous females) are produced. These migrants entirely leave the winter host and fly to a very wide range of the summer hosts, some of the most important of which are *Celastrus articulata*, *Dioscorea japonica*, *Lagerstroemia indica*, etc., and produce young. Most of these young become wingless forms, but a few acquiring wings fly again to different specimens of the summer hosts and produce only wingless forms.

After a few wingless generations on the summer hosts, winged females appear, once more, in June or July, these flying to different specimens of the summer hosts and producing a few winged and many wingless forms. These winged forms again move to different specimens of the summer hosts and all their young are wingless. Then follow many wingless generations one after another on the summer hosts throughout the summer and autumnal seasons until finally the fall migrants (pseudosexuparae) make their appearance, and, as already mentioned, return to the winter host, *Sambucus racemosa*, and produce the young which are comprised of a few winged and many wingless

viviparous females, but no sexual females. Of course no true sexuparae are produced.

The fall migrants of this species, which return to the winter host, correspond to the sexuparae of some Aphididae, but they give birth to viviparous females, and not to oviparous ones. I will therefore give new name "pseudosexuparae" to such viviparous females as the fall migrants of this aphis.

Near Tokyo a few winged males are produced on the summer hosts in the fall, and fly to the winter host with the pseudosexuparae, but soon die without mating, as no oviparous females are produced.

These observations were made near Tokyo during 1917—1920.

Distribution.—Japan: Tokyo, Chiba, Chichibu.

Amphorophora indicum (v. d. Goot)

(Pl. III, B, figs. 8—9)

(Host plants)

Euscaphis japonica and *Staphylea bumalda* in Japan, but unknown in Formosa (Many wingless viviparous females have been collected on an unknown plant at Arisan, Formosa, on October 10, 1918).

The under surfaces of the branches are attacked, suffering very severely.

(Season when the insect is abundant)

Near Tokyo it is rather common from April to October, occrring in greatest abundance from April to May.

(Winged viviparous female)

The winged females are to be found near Tokyo only from the middle of May to the last of June. Some nymphs of the winged form were observed at Arisan, Formosa, in October, 1918.

(Male and oviparous female)

The oviparous females are always wingless, while the males are winged or wingless, making their appearance, near Tokyo, from the middle of October to the last of November. The wingless males are as common as the winged ones, and many intermediates of various degrees are also produced. The sexuparae are always wingless.

(Intermediate)

Many brachypterous forms or other intermediates are observed among the males, although they are only rarely found among the viviparous females.

(Notes on the life history as observed near Tokyo)

The eggs hatch into young nymphs from the middle or the last of February on. These nymphs move upward on the hosts and locate themselves upon the under surface of the apical portions of the branches. The adults of the first generation (stem-mothers) which are always wingless, and are often provided with only 5—jointed antennae, occur from about 10th day of April on. The second generation consists of both wingless and winged forms, the latter far outnumbering the former and the adults appearing from the middle of May on. Most individuals of the third and fourth generations are wingless, while a few are winged and all of the fifth and subsequent generations and the sexuparae are wingless.

The oviparous females outnumber the males and like the stem-mothers are often provided with 5—jointed antennae. The eggs are deposited upon the under surface of the branches and when newly produced have a pale yellowish colour, later darkening to a deep black. Each oviparous female deposits from about three to ten eggs.

(Percentage of hathching)

Of 330 eggs under my observation indoors in 1919, 241 hatched into nymphs, the percentage being about 73%.

(Habit)

The females are rather inactive, resting on the host with the head directed upwards, and have the habit, when disturbed, of moving the posterior pair of legs as if to ward off the offending object, but not dropping to the ground. Not attended by ants.

(Distribution)

Fromosa: Arisan; Japan: Tokyo, Nikko, Sapporo.

Fullawayella violae (Perg.)

Host plant.—*Viola sp.* attacking the stalk.

A few wingless viviparous females were observed on February 20, 1921, at Kwannonzan, near Taihoku.

Fullawayella formosana Takah.

(Host plants)

Allium fistulosum; Allium scorodoprasum var *viviparum.* This aphis sometimes occurs in large numbers, doing some injury to the leaves.

(Season when the insect is abundant)

The greatest abundance on the *Allium fistulosum* seems to be in January and February, since the species has been observed in enomorous numbers on this plant in these months.

(Winged viviparous female)

The winged forms are very common.

(Male and oviparous female)

Near Taihoku it is continuously viviparous throughout the year, no sexes having been obsrved.

(Intermediate)

No intermediates have been observed.

(Habit)

The females are rather inactive, when at rest the direction of the heads being rather various. They do not move the posterior pair of legs, but have the habit of dropping to the ground, when disturbed, Not attended by ants.

(Distribution)

Formosa: Taihoku, Shinten, Toyen.

Pentalonia nigronervosa Coq.

(Pl. VII, A, figs. 6—9).

(Host plants)

Musa spp.: the inner surfaces of the young leaves are attacked. This insect does not cause serious damage.

Alpinia speciosa: the young shoots are attacked. Some wingless viviparous females and nymphs of the winged form have been collected on October 24, 1921, at Kwanshirei, Formosa, and on July 20, 1922, near Taihoku.

(Season when the insect is abundant)

This species may be seen not uncommonly, near Taikoku, at almost any season, but it is not frequently very abundant.

(Winged viviparous female)

The winged forms are produced from time to time thoughout the year, but in very small numbers.

(Male and oviparous female)

It is viviparous all the year near Taihoku, where no sexes have been found even in the winter.

(Intermediate)

No intermediates have been noticed.

(Distribution)

Formosa: Taihoku, Kagi, Kwanshirei.

Vesiculaphis caricis (Full.)

Host plant.—*Cyperus rotundus.*

Numerous wingless viviparous females were collected by Mr. M. Maki on January 25, and winged ones on February 10, 1914. This aphis seems to be quite rare, since I have never observed it during 1920—1922.

Distribution.—Formosa: Taihoku.

Rhopalosiphum nymphaeae (L.)

(Host plants)

Nelumbo nucifera: the lower surfaces of the leaves and the stalks are attacked.

Nymphaea sp.: the leaves and stalks are attacked.

Pistia stratiotes var. *asiatica:* the leaves are attacked.

Sagittaria sagittfolia: the leaves and stalks are attacked.

Near Taihoku the viviparous females inhabit these aquatic plants all the year, without alternating the hosts, and are rarely fouud on the *Prunus communis.*

(Season when the insect is abundant)

Near Taihoku this aphis is very common at almost any season, occasionally occurring in large numbers.

(Winged viviparous female)

The winged forms are very common in Formosa, as well as in Japan.

(Male and oviparous female)

In Formosa it is viviparous all the year, feeding chiefly on the aquatic plants, and no sexes have been observed.

(Intermediate)

No intermediates have been noticed.

(Distribution)

Formosa: Taihoku, Kwannonzan.

Rhopalosiphum pseudobrassicae (Davis).

(Host plants)

Brassica campestris: numerous females, both winged and wingless, were observed on April 18. 1922, near Taihoku.

Rhaphanus sativus; Brassica oleracea.

Capsella bursa-pastoris: winged and wingless viviparous females were observed on the leaves and stalks on March 3, 1921, near Taihoku.

Chrysanthemum coronarium: many winged and wingless viviparous females were observed on March 5, 1921, at Taihoku.

Ranunculus sceleratus: many winged and wingless viviparous females were observed on February 27, 1921, at Sozan, near Taihoku.

This aphis is one of the most important pests in our island, doing serious damage to the *Rhaphanus,* etc.

(Season when the insect is abundant)

Near Taihoku the greatest abundance seems to occur from September to April, its numbers being reduced during the summer.

(Winged viviparous female)

The winged forms are commonly produced in Formosa, as in Japan.

(Male and oviparous female)

This aphis is always viviparous in Formosa, as well as near Tokyo, and no sexual forms have been observed.

(Intermediate)

No intermediates have been noticed.

(Communal life)

This species is occasionally found in groups with *Myzus persicæ* (Sulz.) Not attended by ants.

(Distribution)

Formosa: Taihoku, Sozan, Bokusaku, Boko-island.

Japan: Tokyo.

I have never collected *Brevicoryne brassicæ* (L.) in our island.

Rhopalosiphum lahorensis (Das)

This species is rather rare.

Artemisia vulgaris var. *indica:* winged and wingless viviparous females were observed on the lower side of the leaves on March 13, and October 15, 1921, near Taihoku.

Siegesbeckia orientalis: some viviparous ones were found on March 15, 1921, near Taihoku.

Rhopalosiphum avenæ (Fab.)

syn. *Toxoptera rufiabdominalis* Sasaki
Yamataphis rufiabdominalis Mats.
Y. oryzæ Mats.
Rhopalosiphum papaveris Takah.
Yamataphis papaveris Takah.

(Host plants)

Papaver somniferum: this aphis occurs in enormous numbers on the roots during December and January, producing a heavy and conspicuous infestation, at Toyohara, Formosa. Numerous winged and wingless viviparous females were observed on the leaves and stalks in March, 1918, at Kagi, Formosa.

Prunus mume: numerous winged and a few wingless viviparous females were observed on the leaves on April 19, 1922, at Shinchiku, Formosa.

Oryza sativa: the roots are attacked in Japan. I have never observed the species on this plant in Formosa.

Triticum vulgare, etc.: near Tokyo the aphis sometimes occurs in large numbers, but in Formosa I have never observed it on these plants.

The wing-venation of *Yamataphis* described or figured by Matsumura and Baker is not normal, since the 3rd oblique of which is usually twice forked like that of many other Aphidinæ.

This species is quite rare near Taihoku and seems to be continuously viviparous throughout the year in Formosa.

Distribution.—Formosa: Shinchiku, Kagi, Toyohara.

Japan: Tokyo, Sapporo, etc.

Cavariella araliæ Takah.

(Host plant)

Aralia spinosa: the under surfaces of the tender leaves are attacked.

(Season when the insect is abundant)

The greatest abundance seems to occur from January to March, but its numbers are reduced at other seasons.

(Winged viviparous female)

The winged viviparous females are very rare, only one specimen having been collected on March 23, 1921, at Kwanshirei, Formosa.

(Mlae and oviparous female)

The sexual forms have never been observed.

(Distribution)

Formosa: Taihoku, Urai, Kwannonzan, Kwanshirei.

Cavariella neocapræ Takah.

(Host plant)

Salix warburgii: the lower surface of the young leaves, along the midribs, and the tender shoots are attacked.

(Season when the species is common)

Near Taihoku this species may be found rather commonly, but usually in small numbers, in February and March, and is rarely seen in other months.

(Winged viviparous female)

The winged forms have been observed in February and March.

(Male and oviparous female)

The sexuales do not make their appearance even in the winter, which is spent, near Taihoku, as viviparous females on the leaves.

(Intermediate)

No intermediates have been noticed.

(Habit)

The wingless forms group along the midribs of the leaves, with the heads directed downwards, and are not attended by ants.

(Distribution)

Formosa: Taihoku, Koheki.

Cavariella bicaudata (Essig et Kuw.)

Host plants—*Salix warburgii; Salix sp*, attacking the leaf.

The winged and wingless viviparous females were observed in large numbers on May, 9, 1920, at Maruyama, near Taihoku, and on May, 4, 17, and 25, 1922, near Taihoku.

Toxoptera leonuri Takah.

Host plant—*Leonurus sibiricus*, attacking the leaf.

Many winged and wingless viviparous females were observed on February 12, 1921, near Taihoku.

Toxoptera aurantii (Boyer)

(Pl. I, A, figs. 8—10)

(Host plants).

A. Observations near Tokyo.

Illicium anisatum: the upper surface of the leaves is attacked, and the infested leaves are rolled. The aphis is present on this plant from about the last of May to the last of June, the winged forms occurring from the middle of June on. It is difficult to see the aphis on this plant in other months.

Styrax japonicum: the under surfaces of the young leaves are attacked and the infested leaves are somewhat curled. This aphis may be found on this plant from July to August, but usually in small numbers. The author

observed many winged and wingless viviparous females of the species feeding on the outer surface of the galls of *Astegopteryx nekoashi* Sasaki on this plant, at Shibuya, near Tokyo.

B. Observation near Taihoku.

Ardisia sieboldi: a few winged and wingless viviparous females were observed on April 3, 1922, at Maruyama, near Taihoku.

Coffea arabica: a few viviparous females on the lower surface of the young leaves on September 30, 1921, near Taihoku.

Citrus spp.: the lower surfaces of the leaves, especially the younger ones, are attacked, and the infested leaves are curled. This aphis is present on the *Citrus* at any season, occasionally occurring in abundance.

Thea chinensis: the lower surfaces of the tender leaves are attacked.

Thea caudata: some wingless viviparous females on June 20, 1920; a winged from on January 22, 1921; and numerous winged and wingless ones on July 15, 1921; and a few viviparous ones on April 9, 1922.

Scolopia crenata: some wingless and winged ones on October, 15, 1921.

Salix warburgii: the young leaves are fed upon. The author observed winged and wingless viviparous females in rather large numbers in August, 1920, and in October, 1921.

Ficus retusa: winged and wingless viviparous females on May 7, 1920; wingless individuals on Junuary 15, March, 11, April 9 and 24, and May 14, 1921; a few viviparous females on April 9, 1922, near Taihoku.

Ficus sp.: some wingless individuals on the yong leaves on March 23, 1921.

Ficus foveolata: some viviparous females on the leaves on June 4, 1922, at Urai.

Viburnum odoratissimum: many wingless forms on the young leaves on May 28—30, 1922.

Murraya exotica: a few viviparous females on the young leaves on April 10, 1922, near Taihoku.

Macaranga tanarius: an aphis, collected on this plant on March 2, 1921, seems to be identical with *Toxoptera aurantii*.

(Season when the insect is abundant)

This aphis is one of the most common near Taihoku, occasionally occurring in large numbers at any season.

(Male and opiparous female)

The sexuales have never been observed near Taihoku, being viviparous throughout the year.

(Distribution)

Formosa: Taihoku, Kiirun, Urai, Shinten, Giran, Shinchiku, Kwanshirei.

Japan: Tokyo, etc.

Aphis smilacifoliæ Takah.

(Host plant)

Smilax chinensis: the lower surface of the leaves, along the midribs, and the young stalks are attacked.

(Season when the insect is abundant)

Near Tokyo this aphis is rather common from June onwards throughout the summer, sometimes occurring in large numbers. Near Taihoku it may be observed in large numbers at almost any season.

(Winged viviparous female)

The winged forms are very common at almost any season in Formosa. Near Tokyo they are also very common in the second and subsequent generations.

(Male and oviparous female)

The sexules are not produced near Taihoku, being viviparous throughout the year, while near Tokyo the winged males and wingless oviparous females occur from the first week of November on. The oviparous females outnumber the males as is common with many other Aphididæ, and the sexuparæ seem to be always wingless.

(Notes on the life history near Tokyo)

The eggs hatch about the middle of April. The first generation (stem-mother), the adults of which appear in the first week of May, consists entirely of wingless forms, but the second and the subsequent generations contain both winged and wingless forms. The adults of the second generation occur from about the 20th day of May on. The eggs, when newly produced, are yellow, and are deposited upon the basal parts of the stalks.

(Habit)

The wingless forms are rather inactive, densely covered with a white powder, and have the habit of moving the abdomen from side to side when disturbed.

(Distribution)

Formosa: Taihoku, Hokuto, Sozan, Kagi.

Japan: Tokyo.

Aphis gossypii Glov.

(Host plants)

Acanthopanax aculeatum: many wingless and winged viviparous females were observed on June 24, July 6 and 29, and August 11, 1920, near Taihoku.

Colocasia antiquorum: near Taihoku the aphis is present on the lower sides of the leaves at any season, but not producing a conspicuous infestation. The greatest abundance on this plant is in July or August.

Dichrocephala latifolia: not uncommom on this plant in March near Taihoku.

Gnaphalium japonicum: a winged form on March 5, 1921, and many winged and wingless individuals on April 10, 1922, near Taihoku.

Hibiscus rosa-sinensis: sometimes occurs in large numbers on the leaves and flowers in Formosa, as well as in Japan.

Hibiscus abelmoschus: a few wingless viviparous females on November 25, 1921, near Taihoku.

Hibiscus species: very common in November, near Taihoku.

Justicia procumbens: some wingless and a winged viviparous ones on the flowers on April 13, 1922, near Taihoku.

Liquidambar formosana: the aphis is present on the lower sides of the young leaves from the middle of February to the beginning of April in Formosa, sometimes occurring in great numbers in March.

Papaver somniferum: many individuals, both winged and wingless, were collected in March 1918, at Kagi, Formosa.

Pirus serotina: the aphis is present on this plant from February to July near Taihoku, sometimes occurring in large numbers on the lower sides of the

Japan: Tokyo, etc.

Aphis gossypii Glov. var. **callicarpae** Takah.

(Host plant)

Callicarpa formosana: the lower sides of the young shoots and the leaves are attacked.

(Season when the insect is common)

Near Taihoku it is common through the year, occurring in large numbers from about February to June.

(Winged viviparous female)

The winged forms are produced very commonly at any season.

(Male and oviparous female)

It is viviparous even during the winter without producing sexual forms.

(Distribution)

Formosa: Taihoku, Urai, Shirin, Bokusaku.

The author observed some wingless viviparous females, the dorsa of which were covered with white secretions on October 31, 1921, near Taihoku.

Aphis malvae Koch.

A. Observations near Taihoku.

(Host plants)

Cucumis sativus: the under surfaces of the leaves are attacked, the infested leaves being curled. This aphis is one of most important pests of the *Cucumis*, doing serious damage. It is present on this plant, near Taihoku, from about July to October.

Clerodendron cyrtophyllum and *Clerodendron spp.:* the lower sides of the leaves are attacked and the infested leaves are curled. The aphis may be commonly seen on this plant throughout the year.

Duranta plumieri: the aphis is rarely seen on the young twigs and leaves.

Premna formosana: many viviparous females were observed on the lower side of the curled leaves on April 4, 1922, at Maruyama, near Taihok.

young leaves.

Mosla formosana: the leaves are attacked and the infested leaves are curled. Many winged and wingless viviparous females were observed on July 18, 1922, near Taihoku.

Plantago major: many winged and wingless ones on the stalks of the flowers on March 19, 1921, near Taihoku.

Psidium guyava: some winged and wingless ones on the lower side of the young leaves on August 29, and October 19, 1920; and on March 20, and November 17, 1921, near Taihoku.

Salix warburgii: some or many wingless viviparous females of an aphis, observed on July 11, 1920, and, February 1 and 12, and March 4 and 9, 1921, and March 20 and 30, and April 6 and 7, 1922, near Taihoku, seem to belong to *Aphis gossypii* Glov.

Salvia scapiformis var. *pinnata:* many winged and wingless viviparous females were observed on January 4, 1921, at Urai, Formosa.

Solanum melongena: many viviparous forms on November 8, 1920, near Taihoku. The infested leaves were curled.

Vitex trifolia var. *unifoliolata:* many viviparous females of an aphis, observed on the lower side of the leaves on April 25, 1921, at Kiirun, seem to belong to this species.

(Season when the insect is abundant)

Near Taihoku the species is rather abundant about February and March, but its numbers are sometimes reduced during the suumer.

(Male and oviparous female)

It is continuously viviparous throughout the year in Formosa, where no sexes have been discovered.

(Winged viviparous female)

The winged forms are very common in Formosa, as well as in Japan.

(Communal life)

This aphis is sometimes found with *Aphis pomi* De Geer in groups on the *Pirus serotina*, and with *Myzus persicæ* (Sulz.) on the *Hibiscus* or on the *Solanum melongena*.

(Distribution)

Formosa: Taihoku, Kiirun, Urai, Shirin, Giran, Kagi.

Japan : Tokyo, etc.

Aphis medicaginis Koch.

(Host plants in Formosa)

Vicia fava : this plant is one of the most favored hosts, and the aphis sometimes occurs in great abundance on it about February, doing serious damage.

Astragalus sinicus : a few wingless froms were observed on March 8, 1921, near Taihoku.

Glycine soja : the insect has never been observed in abundance on this plant.

Wikstroemia indica : many winged and wingless forms were observed on May 30, 1920, near Taihoku, and on April 30, 1922, at Tansui.

Aeschynemene indica : many viviparous females, both winged and wingless, were observed on July 13, November 26 and 30, 1920; and on September 21, 1921, near Taihoku.

Pisum sp. : many winged and wingless viviparous females were collected on April 28, 1920, by Dr. Shiraki in the islands of Boko.

(Season when the insect is abundant)

Near Taihoku the greatest abundance seems sometimes to take place on *Vicia fava* about February.

(Winged viviparous female)

The winged forms are very common near Taihoku, as well as in Japan.

(Male and oviparous female)

The sexual forms are never produced in Formosa, being always viviparous even in the winter.

(Distribution)

Formosa : Taihoku.

Japan : Tokyo, etc.

Aphis rumicis L.

(Host plants)

Solanum nigrum : the under surfaces of the leaves are attacked and the

(Season when the insect is common)

The species is common at almost any time.

(Winged viviparous female)

The winged forms are very common at any season like those of many other species of *Aphis*.

(Male and oviparous female)

It is continuously viviparous throughout the year near Taihoku, where no sexes have been found.

(Intermediate)

No intermediates have been noticed.

(Distribution)

Formosa : Taihoku, Kiirun, Shinten, Giran, Toyen, Shinchiku.

B. Observations near Tokyo.

(Host plants)

Clerodendron trichotomum : the aphis may be seen on this plant from April to the beginning of November, but is very rare during the summer.

Cucumis sativus : the aphis is present on this plant from about the middle of June to about the 20th day of July, doing serious damage to the leaves.

(Notes on the life history on the *Clerodendron*)

The eggs hatch about the middle of April, when the buds of the host are beginning to open. The adults of the first generation (stem-mothers), appearing near the end of the same month, are entirely wingless. The second generation consists of both winged and wingless forms, the adults of which make their appearance about the 20th day of May, when the greatest abundance on this plant occurs. The third and the subsequent generations include also both winged and wingless forms, but the sexuparae are entirely winged.

During the summer its numbers on this plant are reduced. The winged males and wingless oviparous females are produced from the last of October on.

All the individuals of the first and second generations are dark green in colour, but some of those of the third and the following generations are yellowish.

(Distribution)

infested leaves are curled.

Rumex crispus : many wingless and winged forms were observed in April, 1922, near Taihoku.

(Season when the insect is common)

Near Taihoku this aphis may be seen rather commonly from February to June.

(Winged viviparous female)

The winged forms are produced at any season in Formosa.

(Male and oviparous female)

It is continuously viviparous throughout the year near Taihoku, where the sexes have never been observed.

(Distribution)

Japan : Tokyo, etc.

Formosa : Taihoku.

Aphis tavaresi Del Guer.

Host plant.—*Citrus sp.*

Some winged and wingless viviparous females were collected by Mr. Maki in November, 1912, near Taihoku. The species seems to be rare, since the author has never observed it in our islaed.

Aphis lilii Licht ?

(Host plant)

Lilium species : the distal parts of the stalks, the lower surface of the leaves, and the buds are attacked.

(Season when the aphis is common)

Near Taihoku this aphis is to be found almost at any season, sometimes occurring in great numbers.

(Winged viviparous female)

The winged forms are numerous as in many other *Aphis*.

(Male and oviparous female)

The sexuales do not make their appearance even in the winter, the species being continuously viviparous in our island.

(Distribution)

Formosa : Taihoku, Kiirun, Shinchiku.

Aphis malvoides v. d. Goot ?

(Host plant)

Bidens pilosa : the stalks and rarely the under surface of the leaves are attacked.

(Season when the insect is common)

The aphis is very common at any season, occasionally occurring in large numbers.

(Winged viviparous female)

Many winged forms are produced from time to time throughout the year.

(Male and oviparous female)

It is continuously parthenogentic all the year, never producing the sexes in Formosa.

(Distribution)

Formosa : Taihoku.

Aphis pomi De Geer.

(Host plants)

Pirus serotina : the lower surfaces of the young leaves are attacked. Near Taihoku this aphis is present on this *Pirus* from April to October, occasionally occurring in large numbers.

Glochidion fortunei and *Glochidion spp.* : the young leaves are attacked. Many winged and wingless viviparous females were found on these plants from February to August, 1921, near Taihoku.

(Season when the aphis is abundant)

Near Taihoku the greatest abundance takes place from March to May on the *Glochidion*.

(Winged viviparous female)

The winged forms are very common in Formosa at any time.

(Male and oviparous female)

Near Taihoku the sexuales do not seem to make their appearance during

the year, even in the winter, since the author has observed the viviparous females in the first week of February on the *Glochidion*.

(Communal life)

Aphis pomi De Geer and *A. gossypii* Glov. are sometimes found together in groups on the *Pirus*-leaves.

(Distribution)

Formosa: Taihoku.

Japan: Tokyo, etc.

Aphis nerii Boyer.

Host plant.—*Asclepias curassavica*, attacking the lower side of the branch and leaf. The winged and wingless viviparous females were observed in enomorous numbers in October and November, 1921, near Taihoku.

When at rest, the species directs the head downwards and has the habit, when disturbed, of moving the abdomen and the posterior pair of legs like many species of *Macrosiphum*.

Aphis saliceti Kalt.

(Host plants)

Salix warburgii; *Salix spp.*: the distal parts of the young twigs are attacked.

(Observations near Tokyo)

This aphis may be seen occasionally in large numbers from June to September, during which period the winged forms are produced from time to time.

The species is usually dark green in colour, but many orange yellow individuals occur in June and July. The author has never observed the sexual forms.

(Observations near Taihoku)

Near Taihoku it is rather uncommon, usually occurring in small numbers, but I have observed it in great numbers in September and October. The winged forms are very scanty in number, although they may be produced at any season.

In Formosa, all the individuals of this aphis are orange yellow in their general colour, the green ones having never been observed; and it is continuously viviparous throughout the year, no sexes having been observed.

(Distribution)

Formosa: Taihoku.

Japan: Tokyo.

Aphis sambuci L.

(Host plants)

Sambucus racemosa; *Sambucus thunbergiana*: the young shoots and the lower surface of the leaves are attacked.

(Season when the insect is abundant)

Near Tokyo, this aphis is common from the middle of April to the last of June, the greatest abundance occurring about the beginning of May. It is very scarce in the months of July, August and September, during which period very small colonies may be seen on the lower surface of the leaves.

(Winged viviparous female)

Many winged forms occur, near Tokyo, in the second, third and fourth generations from the beginning of May onward to the last of June. The first and the fifth and the following generations consist usually only of wingless forms, but the sexuparae are winged or wingless.

(Male and oviparous female)

Near Tokyo the sexes make their appearance from the last of October on. The wingless oviparous females outnumber the winged males.

(Intermediate)

Many brachypterous forms are quite commonly found among the sexuparae, but they are very rare in other generations.

(Notes on the life history near Tokyo)

The eggs hatch about the middle of March, the adults of the first generation (stem-mother) occurring from the middle of April on. The females of the 2nd generation reach their maturity from the last of April to the beginning of May, when the greatest abundance takes place. Every male copulates with several oviparous females in succession and each mating lasts for about seven

minutes. The eggs are yellowish brown, when newly produced, gradually darkening to black. The nymphs and the wingless forms of the second generation secrete a powder from the surface of the dorsa.

(Communal life)

Aphis sambuci L. and *Amphorophora magnoliae* Essig et Kuw. (syn. *Rhopalosiphum sambucicola* Takah.) are sometimes found together in groups on the *Sambucus racemosa*.

(Distribution)

Japan: Tokyo, Sapporo.

Aphis bambusae Full.

(Host plants)

Bambusa nana: the lower surfaces of the leaves are attacked.

Bambusa stenostachya: the young shoots are very rarely attacked.

Bambusa species: the lower surfaces of the leaves are attacked.

(Season when the species is common)

Near Taihoku this aphis is rather uncommen, usually occurring in very small numbers, but the wingless viviparous females were observed in enomorous numbers in February, 1922. Near Tokyo it may be seen commonly on the *Bambusa* from the first week of June to the beginning of November, occasionally occurring in abundance, the greatest numbers apparently being found at the beginning of August.

(Winged viviparous female)

Near Taihoku the winged forms seem to be quite rare, only one having been observed on January 22, 1922. Near Tokyo, they are rather uncommon, but many were observed at the last of June and from the middle of October to the first week of November.

(Male and oviparous female)

The sexuales have never been found in Formosa nor in Japan. Near Taihoku it is probably viviparous throughout the year, not producing any sexual forms.

(Intermediate)

No intermediates have been noticed.

(Communal life)

This species is sometimes found with *Phyllaphoides bambusicola* Takah. in groups near Taihoku.

(Habit)

It is very inactive and does not have the habit of moving the posterior pair of legs when disturbed.

(Distribution)

Formosa: Taihoku. Urai, Kagi.

Japan: Tokyo.

Aphis maidis Fitch.

(Host plants)

Zea mays: the upper and lower surfaces of the leaves are attacked.

Hordeum sativum; some plants of the Gramineae.

Oryza sativa: some wingless viviparous females were observed on this plant indoors on April 10 and 13, 1922, near Taihoku.

Near Taihoku the viviparous females may be seen throughout the year, rarely occurring in great numbers. The winged forms are not uncommon, and the sexuales have never been observed.

Near Tokyo the aphis was observed from June to September, 1919, during which period the winged forms were produced from time to time.

Aphis formosanus Takah.

(Host plants)

Zea mays: the leaves suffer severe injury from this pest.

Sorghum vulgare: the lower surfaces of the leaves are attacked and the infested leaves are withered.

Some plants of the Gramineæ: the under surfaces of the leaves are attacked.

(Observations near Tokyo)

The author has observed continuously some colonies on the *Zea mays* from the last of July to the last of September, 1917, during which period many winged forms were produced from time to time, and the aphis was always abundant.

(Observations near Taihoku)

Near Taihoku the author has observed many winged and wingless viviparous females on October 6, 1920, and October 5 and 16, 1921, on a plant of the Gramineæ; and also on Jnne 23, and July 30, 1921, on *Sorghum*.

(Distribution)

Formosa: Taihoku; Shinten.

Japan: Tokyo (Meguro)

Aphis miscanthi Takah.

(Host plants)

Miscanthus spp.: the under surfaces of the basal parts of the leaves are attacked.

(Season when the insect is common)

Near Taihoku this species may be seen rather commonly at any season, though always occurring in small numbers. I have never observed it in abundance.

(Winged viviparous female)

The winged forms appear at any season, but are quite scanty in number.

(Male and oviparous female)

The sexual forms have never been observed in Formosa, viviparous individuals being seen at all times.

(Intermediate)

No intermediates have been found.

(Communal life)

The wingless females are rarely found in the colonies of *Oregma lanigera* (Zehnt.) on the *Miscanthus*. The colonies of this species are almost always covered with tents by the ant.

(Habit)

This species is quite inactive, grouping very densely, and does not elevate the legs when disturbed.

(Distribution)

Formosa: Taihoku, Urai, Kagi, Kwanshirei, Koshun.

Aphis droseræ Takah.

Many wingless and winged viviparous females were observed on the stalks of the flowers and the lower side of the leaves of *Drosera lourerii*, a well known insectivorous plant, at Sozan, near Taihoku, on February 27, 1821.

Aphis kurosawai Takah.

(Pl. V, A, figs. 5—6)

Many wingless and winged viviparous females were observed feeding on the leaves and the distal parts of the stalks of *Artemisia vulgaris* var. *indica* on March 5, 1921, at Shirin, near Taihoku.

Aphis nasturtii Koch?

Stellaria uliginosa: some wingless viviparous females and a few winged ones were observed on March 5 and 17, 1921, near Taihoku.

Stellaria aquatica: a few wingless forms and nymphs of the winged ones were observed on March 11, 1921. near Taihoku.

Aphis shirakii Takah.

(Host plant)

Melastoma candidum: the lower surfaces of the leaves are attacked. In the summer a few wingless forms are sometimes found feeding on the fruits.

(Season when the insect is common)

Near Taihoku this aphis is common, sometimes occurring in large numbers in almost any month except June, July and August, during which period its numbers are often so reduced that it is difficult to find.

(Winged viviparous female)

The winged forms appear at any season, but are extremely rare, near Taihoku, from May to September.

(Male and oviparous female)

Near Taihoku this aphis is continuously viviparous throughout the year, not producing the sexes.

(Intermediate)

No intermediates have ever been discovered.

(Habit)

This species is very inactive, grouping, though not densely, on the lower surface of the leaves, especially along the midribs. It does not elevate the posterior legs nor drop to the ground even when greatly disturbed.

(Color variation)

The general colour is usually yellow, but many dark green individuals may be found in the late autumn and the winter.

(Distribution)

Formosa: Taihoku, Sozan, Urai.

Aphis ficicola Taka.

Host plant.—*Ficus wightiana.*

This species is very rare, only a few wingless viviparous femeles having been observed on the young leaves on April 23, 1920, at Taihoku.

Aphis somei Essig et Kuw.

(Pl. III, A, fig. 1)

A. Observations in Formosa.

(Host plants)

Sapium sebiferum: the aphis is sometimes observed in abundance on the leaves and young shoots from about June to August.

Bischoffia javanica: some viviparous females were observed on the lower side of the young leaves in February, March and September.

Heptapleurum octophyllum: many wingless viviparous females were observed feeding on the fruits or the leaves on March 5 and May 6, 1921, near Taihoku.

Pittosporum tobira: a few wingless ones on the leaves on March 22, 1921, at Shinkwa.

Viburnum formosanum: many wingless ones in March, 1921, and in July, 1922, at Shinten, near Taihoku.

Polygonum multiflorum: many wingless ones on November 20, 1921, at Tansui.

Rhus javanica: the lower surfaces of the leaves are attacked. The aphis may be seen on this plant from March to September, the greatest abundance occurring in cases from the latter part of March to the end of June, but its numbers are greatly reduced during the summer and autumn, at which seasons a few wingless forms group together on the lower surface of the midribs of the leaves, often being covered with tents by the ants.

(Season when the insect is common)

Near Taihoku it is common from about March to June.

(Winged viviparous female)

The winged froms are very common almost at any season.

(Male and oviparous female)

Near Taihoku this aphis seems to be continuously viviparous during the year, without producing the sexes, since I have observed the viviparous females in February.

(Intermediate)

No intermediates have been observed.

(Distribution)

Formosa: Taihoku, Shinten, Urai, Shirin, Tansui, Shinchiku, Kwanshirei, Shinkwa.

B. Observations near Tokyo.

(Host plants)

Rhus javanica: the aphis inhabits this plant from the beginning of May to about August.

Viburnum sieboldi: the aphis may be seen on this plant from April to September.

(Season when the insect is abundant)

It is one of the most common species near Tokyo, the greatest abundance taking place in May and June, but its numbers are conspicuously reduced from August onwards throughout September.

(Winged viviparous female)

The winged froms make their appearance from about the 10th day of May onwards to September.

(Male and oviparous female)

The winged males and wingless oviparous females make their appearance

from the first week of November on the *Viburnum*. As in many other plant-lice the oviparous females outnumber the males.

(Notes on the life history, the host being *Viburnum sieboldi*)

The eggs hatch the first week of April into nymphs which are black in their general colour. These nymphs feed on the buds, reaching the adult condition the middle of the same month. The first generation consists entirely of wingless forms, while the second and the following generations include both winged and wingless individuals. The adults of the second generation occur from about 10th day of May when the greatest abundance takes place. The sexuparæ are probably provided with wings. Each act of copulation lasts for about four minutes and thirty seconds, and each oviparous female deposits about six eggs which deepen into black as they develope.

(Distriubution)

Japan: Tokyo.

Anuraphis helichrysi (Kalt.)

Bothriospermum tenellum: many winged and wingless viviparous females were observed on the lower surface of the leaves on January 26, and November 20, 1921, near Taihoku.

Eupatorium formosanum: the under surfaces of the leaves are attacked, the infested leaves being rolled. Winged and wingless viviparous females were observed on April 28, 1921, near Taihoku.

Cryptosiphum artemisiæ Buckt.

Artemisia vulgaris var. *indica:* many winged and wingless viviparous females were observed on June 26, 1921, on the Mt. Daiton, near Taihoku.

Brachycolus heraculei Takah.

Apium graveolens: numerous winged and wingless viviparous females were observed on March 20, 1921, at Ako, Formosa.

Heraculeum species: many winged and wingless females in March, April and June, 1920 and 1921. near Taihoku.

Oenanthe stolonifera: winged and wingless forms in large numbers on April 25, 1922, near Taihoku.

Brachysiphoniella gramini Takah.

(Host plant)

Leersia hexandra: only the upper sides of the blades are attacked.

(Season when the insect is common)

Near Taihoku this aphis is very common at any season throughout the year, occasionally occurring in large numbers.

Near Tokyo it may be seen on this *Leersia* from the beginning of August to the last of October, during which period it is occasionally most abundant.

(Winged viviparous female)

The winged forms occur at any season, but are very reduced in numbers near Taihoku. Near Tokyo they appear from time to time during the months of August, September and October, but are rather reduced in numbers.

(Male and oviparous female)

In Formosa this species is always viviparous, without producing sexual forms.

(Intermediate)

No intermediates have been observed.

(Habit)

It is very inactive and the wingless forms are sometimes submerged in the water on the blades of the host.

(Distribution)

Formosa: Taihoku, Kagi. Shinka.

Japan: Tokyo.

Hyalopterus pruni (Fab.)

A. Observations in Formosa.

(Host plants)

Phragmites communis: the upper sides of the blades are attacked. In Formosa the viviparous females inhabit this plant at any season throughout the year.

Prunus persica: many winged and wingless viviparous females were observed on the lower side of the leaves on April 9, near Taihoku, on April 17, at Shinchiku, and on April 30, 1922, at Tansui.

Prunus communis: many viviparous females, both winged and wingless, were observed on April 17, 1922, ot Shinchiku.

(Season when the insect is abundant)

On *Phragmites communis* it is usually found in small numbers at any season, but on *Prunus* it occurs in large numbers in April.

(Winged viviparous female)

The winged forms are produced commonly from time to time.

(Male and oviparous female)

It is viviparous throughout the year, without the sexuales being produced.

(Intermediate)

No intermediates have been noticed.

(Distribution)

Formosa: Taihoku, Tansui, Urai, Shinchiku,

B. Observations near Tokyo.

(Host plants)

Phragmites communis: the aphis is present on this plant from about June to the last of November.

Prunus persica: the viviparous females are found on this plant from May to the last of October.

(Season when the insect is abundant)

This is one of the most common aphids near Tokyo. It occurs on *Phragmites* in abundance from the middle of June to the first week of July, but is quite rare during the summer. On *Prunus* the greatest abundance is in June and July.

(Winged viviparous female)

Many winged forms appear in almost every viviparous generation and the sexuparæ are always provided with wings.

(Male and oviparous female)

The winged males and sexuparæ, which return to the winter host, *Prunus persica*, are produced about the middle of October on *Phragmites*.

Two forms are found of these sexuparæ, the form *maxima* and the form

minima.

(Intermediate)

No intermediates have been observed.

(Distribution)

Japan: Tokyo, Sapporo, etc.

Greenidea taiwana Takah.

Host plant—*Meliosma rhoifolia*.

This aphis is rare, some winged and wingless viviparous females having been observed on the young leaves on June 21, 1920, at Shinten, near Toihoku, Formosa.

Greenidea quercifoliæ Takah.

Host plant.—*Quercus variabilis*.

This is also very rare, only a few wingless viviparous females having been observed on the young leaves on May 29, 1920, at Taihoku.

Greenidea formosanum (Maki)

(Host plants)

Psidium guyava: the young shoots and the lower surface of the tender leaves are attacked.

Rhodomyrtus tomentosa: the distal parts of the shoots and the tender leaves are attacked.

(Season when the insect is common)

This aphis is rather common, near Taihoku, in April and May, but does not occur in abundance. Its numbers are greatly reduced during the months of July to October, during which period it is often extremely difficult to find in the field.

(Winged viviparous female)

The winged forms are produced from time to time at any season, but always in small numbers.

(Male and oviparous female)

Near Taihoku this species is always viviparous, not producing sexual forms.

(Intermediate)

No intermediates have been discovered.

(Habit)

The aphis is rather active, not grouping densely and sometimes being sporadic, and does not elevate the posterior pair of legs, nor drop to the ground when disturbed, as is common for other species of *Greenidea*.

(Distribution)

Formosa: Taihoku, Shirin, Urai, Kagi, Kwanshirei, Koheki, Kuraru.

Greenidea nigrofasciatum (Maki)

A few wingless viviparous females and many winged ones were observed on the lower side of the young leaves of *Quercus species*, along the midribs, on April 11, 1922, at Shinten, near Taihoku.

Greenidea ficicola Takah.

(Pl. V, B, figs. 1—2).

(Host plant)

Ficus retusa: the under surfuce of the young leaves and the tender shoots are attacked.

Ficus obscura: the under surfaces of the young leaves are attacked.

(Season when the insect is common)

This aphis is common in April and May, but does not occur abundantly. It is extremely rare, near Taihoku, from the middle of June to the last of October.

(Winged viviparous female)

The winged forms are produced from time to time at any season, but are very scanty in numbers.

(Male and oviparous female)

This aphis is viviparous throughout the year, no sexual forms having been observed.

(Intermediate)

No intermediates have been found as in other species of *Greenidea*.

(Communal life)

A few wingless viviparous females were observed among groups of *Gynaikothrips Uzeli* Zimm. feeding on *Ficus retusa*, on November 11, 1920, near Taihoku.

Greenidea and *Eutrichosiphum* are usually not attended by ants, but this species is quite rarely visited by *Crematogaster rogenhoferi*.

(Distribution)

Formosa: Taihoku, Urai.

Greenidea kuwanai (Pergande)

(Host plants)

Quercus acuta, Q. crispula, Q. dentata, Q. glandulifera, Q. serrata, Q. variabilis, etc.: the young shoots of all are attacked.

(Season when the insect is common)

Near Tokyo this aphis may be very commonly seen from the last of May on, the greatest abundance occurring in May and June, but the numbers being greately reduced from the last of July onward thoughout August.

(Winged viviparous female)

The winged forms are produced commonly in the second and the following generations

(Male and oviparous female).

The oviparous females, which are winged, occur in November and December The males have never been discovered.

(Intermediate)

No intermediates have been noticed.

(Distribution)

Japan: Tokyo.

Greenidæ tenuicorpus (Okaj.)

Lagerstrœmia indica: a winged viviparous female found on the young leaf on June 13, 1919, near Tokyo, seems to belong to this species.

Carpinus japonica : a few winged forms collected on this plant on June 5 and 6, 1919, near Tokyo, seem also to belong to this species.

The oviparous females are provided with wings, like those of *Greenidea kuwanai* (Perg.), the males having never been observed.

Eutrichosiphum lithocarpi (Maki)

Host plant.—*Lithocarpus uraiana.*

The winged and wingless viviparous females were observed in great abundance on the young shoots and leaves on October 2, 1921, at Urai, near, Taihoku.

Eutrichosiphum minutum Takah.

Host plant.—*Trachelospermum jasminoides.*

The winged and wingless viviparous females were observed in large numbers on the under surface of the leaves and the stalks on March 20, at Kagi, and on March 23, 1921, at Kwanshirei, Formosa.

Eutrichosiphum pasaniæ (Okaj.)

Host plants: *Quercus cuspidata, Quercus sp.*

Near Tokyo this aphis may be commonly seen from June to October occasionally occurring in rather large numbers and the winged forms are produced rather commonly. The winged males make their appearance from about 10th day of October on. The oviparous females are probably provided with wings as in *Greenidea kuwanai* and *G. tenuicorpus.*

Cervaphis quercus Takah.

(Pl. V, B, fig. 6)

(Host plant)

Quercus variabilis : the lower surface of the young leaves and the tender shoots are attacked.

(Season when the insect is abundant)

Near Taihoku this species is very rare, only the wingless viviparous females having been observed in small numbers from June to October.

Near Tokyo the wingless viviparous females may be seen rather commonly from June to October, occasionally occurring in great abundance.

(Winged viviparous female)

No winged viviparous females have been discovered in Formosa nor in Japan. The sexuparæ are wingless.

(Male and oviparous female)

Near Taihoku, no sexual forms have been found, but near Trkyo, numerous oviparous females make their appearance from July onward throughout the summer, and it is a very remarkable fact that they are always provided with wings as in some species of *Greenidea.*

Each oviparous female deposits about five eggs which are yellow when newly produced. No males have been observed.

(Intermediate)

No intermediates have been found in Formosa and Japan.

(Habit)

This aphis is quite inactive, not elevating the posterior legs nor dropping to the ground when disturbed. It is sometimes attended by *Polyrhachis dives* in Formosa.

(Distribution)

Formosa: Taihoku.

Japan: Tokyo.

Myzocallis bambusicola Takah.

(Host plants)

Dendrocalamus latiflorus : the lower surfaces of the leaves are attacked.

Bambusa stenostachya : the young shoots are seldom attacked.

(Season when the insect is common)

This aphis is rather rare near Taihoku, not occurring in abundance.

(Winged viviparous female)

All the viviparous females are always provided with wings as in other species of *Myzocallis.*

(Male and oviparous female)

It is viviparous throughout the year, not producing sexual forms.

(Intermediate)

No intermediates have been found as in many other species of *Myzocallis*.

(Habit)

It is sporadic, directing the head downwards, and jumping from the host when disturbed. Not attended by ants as in many other species of *Myzocallis*.

(Distribution)

Formasa: Taihoku.

Myzocallis querciformosanus Takah.

Host plant—*Quercus dentata*.

Many winged viviparous females were observed on the lower surface of the leaves on March 2, 1919, at Taichyu, Formosa.

Myzocallis yokoyamai Takah.

(Host plants)

Quercus glandulifera; Q. crispula: the lower surfaces of the leaves are attacked.

(Season when the species is common)

Near Tokyo this species is not rare, sometimes occurring in maderate numbers, but it is not so common as *Myzocallis capitata* Essig et Kuw. and *M. quercicola* (Mats.)

(Winged viviparous female)

All the individuals of each viviparous generation are provided with well developed wings.

(Male and oviparous female)

I have never observed the sexual forms.

(Notes on the life history near Tokyo)

The eggs hatch at the middle of April, the adults of the first generation appearing at the beginning of May.

(Communal life)

This species and *M. quercicola* (Mats.) are sometimes found together.

(Distribution)

Japan: Tokyo.

Myzocallis quercicola (Mats.)

(Host plants)

Quercus glandulifera: the lower sides of the leaves, along the midribs, are attacked. The young nymphs of the first generation sometimes feed on the upper surface and the stalks of the leaves.

Quercus dentata, Q. crispula: the lower surface of the leaves are attacked.

(Season when the insect it common)

Near Tokyo it is common from the beginning of May to the last of October, occasionally occurring in large numbers, but generally less common during the summer.

(Winged viviparous female)

All the viviparous females are always provided with wings.

(Male and oviparous female)

Near Tokyo the winged males and wingless oviparous females make their appearance from the beginning of November on. The sexuparae are yellowish in their general colour, and are present from the middle of October to about the 20th day of November, during which period the abundance takes place.

(Intermediate)

No intermediates have ever been noticed.

(Notes on the life history near Tokyo)

The eggs hatch into nymphs at the beginning or middle of April. These nymphs are greenish in colour, unlike those of the second and the following generations which are dark purplish. The adults of the first generation occur from the beginning of May on.

(Distribution)

Japan: Tokyo, Sapporo.

Myzocallis pseudoalni Takah.

(Host plant)

Alnus formosana: the lower surfaces of the leaves are attacked.

(Season when the insect is common).

Near Taihoku this aphis is scarce in numbers almost at any season, especially so in July and August, during which months it is extremely difficult to find in the field.

(Winged viviparous female)

The viviparous females are always provided with wings.

(Male and oviparous female)

It is continuously viviparous throughout the year near Taihoku, where no sexual forms have ever been discovered.

(Intermediate)

No intermediates have been noticed.

(Habit)

It is sporadic in habit, not being visited by ants.

(Distribution)

Formosa: Taihoku.

Myzocallis sasae (Mats.)

(Host plant)

Sasa paniculata: the lower surface of the leaves and the young shoots are attacked.

(Season when the insect is common)

Near Tokyo this species may be found rather commonly in moderate numbers from May to October.

(Winged viviparous female)

The viviparous females are always provided with wings.

(Intermediate)

I have never observed any brachypterous forms.

(Male and oviparous female)

Some winged males and wingless oviparous females were observed on October 21, 1917, near Tokyo.

(Distribution)

Japan: Tokyo, Sapporo.

Myzocallis capitata Essig et Kuw.

(Host plants)

Quercus serrata, Q. variabilis, Castanea vulgaris: the lower surfaces of the leaves, along the midribs, are attacked.

(Season when the insect is common)

Near Tokyo this species is rather common, occasionally occurring in large numbers.

(Winged viviparous female)

As in many other *Myzocallis*, no wingless viviparous females have been found.

(Male and oviparous female)

The winged males and wingless oviparous females, the latter far outnumbering the former, appear from the last of October to about the 20th day of November. The sexuparae may be seen until the middle of November.

(Intermediate)

No intermediates have been found.

(Distribution)

Japan: Tokyo.

Myzocallis arundicolens (Clark.)

Host plant.—*Bambusa sp.:* the under surfaces of the leaves are attacked.

Near Tokyo this aphis is quite rare, a few winged viviparous females occurring about June, and it is extremely difficult to find during other months.

Myzocallis arundinariae Essig.

Host plant.—*Bambusa sp.:* the lower surfaces of the leaves are attacked.

Many winged viviparous females were collected by Mr. Kuwayama at Uwajima, Shikoku, Japan, in March, 1919.

Myzocallis bambusifoliae Takah.

(Pl. II, B, fig. 6)

Host plant.—*Bambusa stenostachya.*

This species is quite rare, a few winged viviparous females having been observed on the lower surface of the leaves on March 5, 1921, and March 30, 1922, near Taihoku, and on March 23, 1921, at Kwanshirei, Formosa.

Myzocallis kuricola (Mats.)

(Pl. VI, A, figs. 1—4)

(Host plant)

Castanea vulgaris, Quercus serrata, Q. variabilis, Q. sp.: the lower surfaces, along the midribs, of the leaves are attacked. The young twigs are also sometimes attacked.

(Season when the insect is common)

This aphis is very common near Tokyo from about the middle of May to the last of October, but its numbers are sometimes greatly reduced about July.

(Winged viviparous female)

All the viviparous females are provided with wings, the wingless ones having never been discovered as in other species of *Myzocallis*.

(Male and oviparous female)

The winged males and wingless oviparous females, the latter outnumbering the former, appear at the last of October, near Tokyo.

(Intermediate) See plate VI, A, figs. 3—4.

Among the winged viviparous females there are found two forms, the macropterous and the brachypterous, which are almost equal in number or the latter sometimes outnumbering the former. The brachypterous forms are produced very commonly at any season as are the macropterous ones, but their thorax are not well developed, being provided with very short wings.

It is a very remarkable fact, however, that the hooks on the hind wings of the brachypterous forms are as well developed as are those of the macropterous forms. The males are macropterous.

(Habit)

The aphis is rather inactive, grouping rather densely along the midribs of the leaves. The viviparous females secrete white powders from the surface of the dorsa.

(Distribution)

Japan: Tokyo.

Callipterus kahawaluokalani (Kirk.)

(Host plants)

Lagerstroemia indica; Lagerstroemia spp.: the lower surfaces of the leaves are attacked.

(Season when the insect is common)

Near Taihoku this species is not uncommon, the greatest abundance sometimes occurring about May, but the numbers being sometimes greatly reduced during July and August. Near Tokyo it is very common, but is not frequently of great abundance.

(Winged viviparous female)

All the viviparous females are winged.

(Male and oviparous female)

The winged males and wingless oviparous females make their occurrence about the middle of October near Tokyo, but near Taihoku the males appear about the last of the same month and the females from the beginning of November on.

The females outnumber the males in Formosa, as well as in Japan.

In Formosa almost all the species are viviparous throughout the year, without producing sexual forms, and this is the only species which is, at present, known to produce the sexuales in the fall and to pass the winter in the egg condition.

(Intermediate)

No intermediates have been discovered.

(Distribution)

Japan: Tokyo.

Formosa: Taihoku.

Calaphis magnolicolens Takah.

Japanese Aphididae.—1. p. 27 (1921). 高橋良一著作集第二號 p. 24 (1921).

(Host plant)

Magnolia hypoleuca: the lower surfaces of the leaves are attacked.

(Host plants)

Carpinus yedoensis: the lower sides of the twigs are attacked.

Carpinus japonica: the lower surfaces of the twigs are rarely attacked.

(Season when the species is common)

Near Tokyo this aphis may be found not uncommonly from spring until fall, sometimes occurring in large numbers on *Carpinus yedoensis*.

(Winged viviparous female)

The viviparous females are always provided with wings.

(Male and oviparous female)

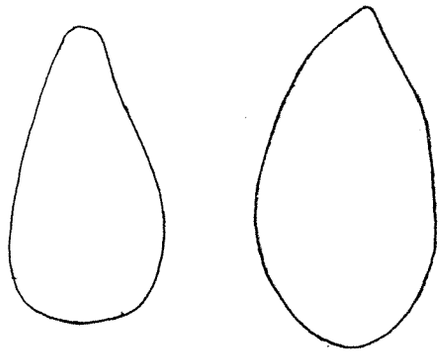
The winged males and wingless oviparous females make their appearance from the last of October to the middle of November. The males are scarce.

(Intermediate)

I have observed some brachypterous viviparous females.

(Notes on the life history near Tokyo)

The adults of the first generation, which are winged like those of the other generations, appear at the beginning of May and disappear entirely about the 20th day of the same month when those of the second generation appear; the females of the third generation reach maturity about the 7th day of June and those of the fourth at the end of the same month.



Eggs of *Chromaphis carpinicola*.

The eggs are yellow in colour when newly produced, gradually darkening to black and are conspicuously variable in shape as shown in the figures. The eggs are deposited upon the stems or branches of *Carpinus*.

(Habit)

This aphis, especially the nymph, is quite inactive and rather sedentary, resting on the lower side of the twigs, and does not jump nor elevate the posterior pair of legs when disturbed.

(Distribution)

Japan: Tokyo.

(Season when the insect is common)

This aphis is rather commonly found near Tokyo where it is often most abundant at the last of May and in June.

(Winged viviparous female)

All the viviparous females of each generation are provided with well developed wings.

(Male and oviparous female)

The winged males and wingless oviparous females occur, near Tokyo, from the middle of October on. The females outnumber the males as in many other plant-lice. Each sexupara often gives birth to both males and sexual females.

(Intermediate)

No intermediates have been discovered.

(Notes on the life history near Tokyo)

The eggs hatch into nymphs at the end of April, the nymphs attaining their adult condition about the 20th day of May. The nymphal stage of each of the second and following generations lasts for about two weeks, in one life cycle, about nine generations being repeated one after another.

The viviparous females often begin to produce young soon after the last molting and when their wings are not yet dried up. The oviparous females begin to oviposit a few days later after this molt. This fact is also very commonly to be observed among many other Callipterina, such as *Myzocallis*, *Neophyllaphis*, etc.

Each female deposits about 27 eggs upon the stems of the *Magnolia* at the end of October.

(Habit)

This aphis, especially the nymph, is very inactive, resting along the midribs of the leaves, with the head directed toward the leaf-base.

(Distribution)

Japan: Tokyo.

Chromaphis carpinicola Takah.

Japanese Aphididae.—1, p. 27 (1921). 高橋良一著作集第二號 p. 21 (1921).

rather inactive, and does not jump from the host, nor move the posterior pair of legs, when disturbed.

(Distribution)

Formosa: Taihoku, Shinten, Kwanshirei.

Neophyllaphis podocarpi Takah.

(Host plants)

Podocarpus macrophylla: the lower surface of the leaves, especially the younger ones, is attacked.

Podocarpus nageia: the lower surface of the young leaves is attacked and the infested leaves are somewhat curled.

(Season when the insect is abundant)

Near Tokyo the viviparous females are very common from May until the middle of November, occasionally occurring in large numbers.

Near Taihoku they are also very common throughout the year, occasionally being abundant at any season.

(Winged viviparous female)

Near Taihoku, as well as near Tokyo, the winged forms make their appearance almost in every viviparous generation, but they are not as common as the wingless forms.

The females of the first generation (the stem-mothers) and the sexuparae always seem to be apterous.

(Male and oviparous female)

The oviparous females of almost all the Aphidinae are wingless, but those of the present species are always provided with well developed wings. Winged oviparous females have also been observed, as already mentioned, in *Greenidea* and *Cervaphis*.

This aphis also differs from most Aphidinae in that the sexuales appear from about May until the last of November, during which period both the viviparous and oviparous females may be seen on a single host tree. This occurrence of the sexuales has been observed only near Tokyo, not in Formosa where the species is continuously viviparous throughout the year, without producing the sexes, except as mentioned below. The males are winged as

Neochromaphis carpini Takah.

Japanese Aphididae.—1, p. 28 (1921). 高橋良一著作集第二號 p. 24 (1921).

Host plant.—*Carpinus japonica*, attacking the lower side of the branch.

Near Tokyo this aphis is rather rare. The viviparous females are always provided with wings, but the oviparous ones, which occur about November, are apterous.

The nymphs are very inactive and rather sedentary, like those of *Chromaphis carpinicola* Takah., the adults not having the habit of jumping from the host even when disturbed.

(Distribution)

Japan: Tokyo.

Phyllaphoides bambusicola Takah.

(Host plant)

Bambusa stenostachya: the lower surfaces of the leaves are attacked.

(Season when the insect is common)

Near Taihoku this aphis is to be found not uncommonly in small or large numbers almost at any season. It seems to be rather numerous at times.

(Winged viviparous female)

The winged forms, as well as the wingless ones, occur from time to time throughout the year. These two forms are almost equal in number or the winged ones a little outnumber the wingless.

(Male and oviparous female)

It is continuously viviparous throughout the year, no sexual forms having been observed.

(Intermediate)

No intermediates have been noticed.

(Communal life)

This species is sometimes found associated with *Aphis bambusae* Full.

(Habit)

This aphis is gregarious, directing the head in various directions; it is

in many other Aphidinae and are scanty in numbers.

Near Taihoku, as mentioned above, this aphis is viviparous throughout the year, but I have observed one winged oviparous female on May 30, 1920, which occurrence seems to be abnormal.

Every sexupara may give birth to both the sexuales and the wingless viviparous females.

(Intermediate)

The brachypterous viviparous females are very rare. The eyes of the wingless form usually consist of only three facets, but intermediates often occur, in which these consist of more than three facets. The word "immediate" on the pages 75 and 78 of the "Aphididae of Formosa—1" is a lapsus of "intermediate."

(Habit)

This aphis is quite inactive and sometimes groups densely, directing the head downwards, and does not drop to the ground nor elevate the posterior pair of legs when disturbed. The jumping habit has not been observed.

(Distribution)

Japan: Tokyo, Chiba.

Formosa: Taihoku.

Shivaphis celticolens (Essig et Kuw.)

(Host plant)

Celtis sinensis: the lower surfaces of the leaves, especially the younger ones, are attacked.

(Season when the species is common)

Near Tokyo this aphis may be seen very commonly from about the beginning of June to the middle of October, during which period it is occasionally abundant.

(Winged viviparous female)

The females of the first generation are probably wingless, but those of each of the second and the subsequent generations are winged or wingless. Among the winged forms many brachypterous individuals are found in any month from June to October as in *Myzocallis kuricola* (Mats.)

(Male and oviparous female)

The author has never collected these sexual forms, which probably occur in November near Tokyo.

(Intermediate)

Many brachypterous females are normally produced almost in every generation, as in *Myzocallis kuricola*, the thorax of which forms are not well developed, being provided with very short wings.

(Habit)

The aphis is rather inactive, and does not jump from the host when disturbed.

(Distribution)

Japan: Tokyo.

Notes on the brachypterous forms of Aphididæ.

The brachypterous form may be seen in some Aphididæ as in many other insects. In these forms of the family two rather clearly defined types of wing structure may be recognized as follows:

1. Wings having essentially a nymphal character, i. e., developing as normal wings up to the last nymphal stage, but failing to expand.
2. Wings essentially normal, except for their much smaller size.

Of these two groups the first is found in the tribes of Aphidina, Lachnina, etc, and the second only in some Callipterina, *Myzocallis kuricola* (Mats.) and *Shivaphis celticolens* (Essig et Kuw). The brachypterous forms, which belong to the first group, are produced somewhat uncommonly or extremely rarely in the most Aphidina and Lachina, but not uncommonly among the sexuparæ of *Aphis sambuci* L., the males of *Amphorophora indicum* (v. d. Goot) and the winged viviparous females, that are parasited by a species of Chalcididæ, of *Macrosiphum formosanum* Takah., as already mentioned; and the brachypterous ones of the second group are of normal occurrence in *Myzocallis kuricola* (Mats) and *Shivaphis celticolens* (Essig et Kuw).

Shivaphis celti Das.

(Host plant)

Phyllaphis fagifoliæ Takah.

Trans. Sapporo Nat. Hist. Soc. pp. 194—195 and p. 200 (1919)

(Host plant)

Fagus species : the lower surfaces of the leaves are attacked.

(Season when the aphis is common)

Near Tokyo this species is rather rare, rarely becoming abundant, and during the summer becoming very scarce.

(Winged viviparous female)

In many Aphididæ the females of the first generation are wingless, the winged forms appearing in the second and the following generations, but in *Phyllaphis fagifoliæ* the females of the first and second generatians are provided with wings, and those of the third and the following generations, and the sexuparæ, are wingless.

(Male and oviparous female)

Near Tokyo the winged males and wingless oviparous females make their appearance from the end of October until the beginning of November. The male insects are scanty in numbers.

(Intermediate)

No intermediates have been observed.

(Notes on the life history near Tokyo)

The eggs hatch about the middle of April, and the winged forms of the first generation have a nymphal stage lasting about two weeks. The adults of the second generation occur at the end of May, and from that time on a few wingless generations are repeated until the sexual forms are produced in the fall. Each oviparous female places upon the branches of the *Fagus* 15 or 16 eggs, which are covered, by means of the posterior pair of legs, with white wax secreted by their mother insects.

(Habit)

It is very inactive in habit.

(Distribution)

Japan : Tokyo.

Celtis nervosa : the lower surface of the leaves, especially the young ones, and the distal parts of the tender shoots are attacked.

(Season when the aphis is abundant)

Near Taihoku this aphis is very common, often being most numerous in May, June and July, usually becoming scarcer from late summer onward throughout the winter.

(Winged viviparous female)

The winged forms are very common at any season except during winter when they become so scarce that it is often quite difficult to find them.

(Male and oviparous female)

Near Taihoku, the leaves of the young *Celtis* are green even in the winter and the aphis feeding on such young hosts continues to produce the young throughout the winter, without producing the sexual forms. However, the leaves of the older *Celtis* begin to wither gradually and from November until the last of February of the following year all the leaves are fallen ; the aphis on these leaves becomes more scarce as the winter approaches, and does not produce oviparous forms, all the individuals (viviparous females) vanishing on the falling leaves during the winter. However, a few winged males, which soon die, without copulation, as no oviparous females are produced, sometimes occur on such old trees in December. Thus the aphis is viviparous throughout the year near Taihoku.

In the spring some winged forms migrate to the old trees from the young and new colonies are thus established there.

(Intermediate)

The intermediates are quite rare, only one brachypterous viviparous female having been observed on July 27, 1920, at Taihoku. The hooks on the hind wings of this female were well developed.

(Habit)

This aphis is rather inactive, not dropping to the ground nor jumping from the host when disturbed. When at rest the head is often directed toward the base of the leaf.

(Distribution)

Formosa : Taihoku, Kagi.

(Distribution)

Formosa : Taihoku.

Japan : Tokyo.

Dilachnus pinidensifloræ (Essig et Kuw.)

Host plants.—*Pinus sp. and Pinus massoniana ;* the lower sides of the twigs are attacked.

A few wingless and numerous winged, viviparous females were observed on February 19, 1921, a few nymphs on March 8, numerous wingless individuals on March 30, and a few winged and numerous wingless viviparous females on July 30, 1922, near Taihoku.

This aphis groups very densely and has the habit, when disturbed, of elevating the posterior pair of legs.

Lachnus thujafoliæ (Theob.)

(Host plant)

Thuja orientalis : the twigs, especially the lower side, are attacked, and a few wingless forms are sometimes found on the leaves.

(Season when the insect is common)

Near Taihoku this aphis is rather rare, usually occurring in very restricted numbers, but the author has observed the wingless viviparaus females in abundance on June 30 and July 8, 1922.

Near Tokyo it may be seen not uncommonly, but is not often abundant.

(Winged viviparous female)

The winged forms are extremely rare, but I have observed one or two nymphs of the winged forms on July 6 and 25, and November 11, 1920, May 27, 1921, and June 30, 1922, near Taihoku.

(Male and oviparous female)

Near Taihoku it is viviparous all the year, without producing the sexual forms.

(Intermediate)

No intermediates have been noticed.

(Habit)

Periphyllus formosanus Takah.

Host plant.—*Acer sp. :* the lower sides of the leaves are attacked.

A few wingless viviparous females, which were probably the stem-mothers, and many winged ones and their nymphs were observed at Sozan, near Taihoku, on February 13, 1921, and a few winged and wingless forms on the same plant on February 27, but only the dimorphs margined with many lamellæ were found on June 12.

The life histories of *Periphyllus acerifolicæ* Takah., *P. kœlreuteriæ* Takah., and *P. japonica* (Essig et Kuw.) were given in detail in the Zool. Mag. (The Dobutsugaka-Zasshi) Tokyo, vol. xxxi, No. 372. pp. 323—329 (1919).

Dilachnus piniformosanus Takah.

Aphididæ of Formosa.—1, p. 82 (1921)

(Host plants)

Pinus spp : the distal parts of the twigs and the young shoots are attacked.

(Season when the insect is common)

Near Taihoku this aphis may be seen in very small numbers at any season, but is most common on the young shoots about the 20th day of April. I have never observed it in abundance. Near Tokyo, it is scarce throughout the year, as in Formosa.

(Winged viviparous female)

The winged forms are extremely rare, but they seem to occur during any month, since I have observed them in February, May, September and November, near Taihoku.

(Male and oviparous female)

It is viviparous throughout the year, not producing the sexuales near Taihoku, nor near Tokyo.

(Intermediate)

No intermediates have been noticed.

(Habit)

The aphis is rather active, not grouping densely, and directs the head downwards when at rest.

This aphis is very inactive, very densely grouping on the twigs or in the fissures of the stems or twigs. It does not elevate the posterior pair of legs even when disturbed. The directions of the heads, when at rest, are variaus.

(Communal life)

The colonies of this species are sometimes covered with the tents by *Crematogaster rogenhoferi*.

(Distribution).

Japan: Tokyo.

Formosa: Taihoku.

Tuberolachnus viminalis (Fonsc.)

Host plant.—*Salix warburgii*, attacking the lower surface of the branches. Some winged and wingless viviparous females were observed on April 29, 1920, and February 7, 10, 21, and 27, 1921, near Taihoku, where it seems to pass the winter as a viviparous female, without producing the sexual forms. The aphis has the habit, when disturbed, of elevating the posterior legs. The head is directed upwards when at rest as in *Stomaphis*.

Pterochlorus tropicalis van der Goot.

(Host plants)

Quercus dentata, *Q. glandulifera*, *Q. serrata*, *Q. variabilis*, *Quercus spp.*, *Castanea vulgaris*, etc.: the branches and twigs are attacked.

Betula alba: the branches or twigs are rarely attacked. A winged viviparous female was observed producing young on June 12, 1917, and some wingless ones were seen on July 8, 1919 near Tokyo.

(Season when the insect is abundant)

Near Tokyo this insect is abundant in the spring, most so is May, but its numbers are greatly reduced during the months of July and August.

(Winged viviparous female)

The first generation (stem-mother) consists only of wingless froms, but each of the second and the following generations produce both winged and wingless individuals.

The sexuparæ appear to be winged at times.

(Male and oviparous female)

The winged males and wingless oviparous females make their apperance about the beginning of November, and the latter may be found, near Tokyo, until about the 10th day of December. The males are very scanty in number.

(Intermediate)

A brachypterous female was observed on May 11, 1918, near Tokyo.

(Notes on the life history near Tokyo)

The eggs hatch at the beginning of April. The adults of the first generation, which are wingless, appear during the last of the same month, and those of the second generation, which are winged or wingless, with the former outnumbering the latter, appear about the 10th day of May, when they are most abundant. During the summer the insect is so scarce that it is somewhat difficult to detect it in the field. When newly emerged, the abdomens of the winged viviparous females are very small, but in a few days they become so large that the insects are not able to fly. Every oviparous female deposits 8—14 eggs, which, when newly produced, are yollowish brown in colour, gradually darkening in about a week to a deep black. All the eggs of all the females in a single colony are usually deposited in groups upon the south side of the stem of the host tree.

(Communal life)

This aphis is often attended by *Lasius niger*, and I have sometimes observed the ant carrying the young aphis, holding it in its mouth.

(Habit)

This aphis groups rather densely on the upper side of the branches or on the stems, and some wingless females are occasionally found in the fissures of the host trees. In September and November the aphis is often seen grouped on the south side of the stems, where the rays of the sun are falling.

It is very active in habit, unlike many other Lachnina, and, when approached, it elavates the posterior pair of legs, as if to ward off the offending object, and, when strongly disturbed, it begins to walk away or drops to the ground.

I have sometimes observed the females running about on the host with the young protruding from the genital opening.

July to the 20th day of October, 1918, at which time the greatest numbers were occasionally found.

(Winged viviparous female)

Many winged forms were observed, near Tokyo, on July 12 and from the end of September until the 18th day of October, 1918.

(Male and oviparous female)

No sexuales have been observed. Most sexuparæ seem to be winged, although a few wingless individuals are found.

(Intermediate)

One brachypterous viviparous female was found on July 13, 1918, near Tokyo.

(Communal life)

This species is often found in the fissures of the stems, attended by ants.

(Habit)

Like other species of *Stomaphis* this species is quite inactive, and does not group densely, directing the head upwards.

(Distribution)

Japan: Tokyo.

Stomaphis pini Takah.

Host plant.—*Pinus densiflora:* the stems, especially the basal parts, are attacked.

This *Stomaphis* is very scarce near Tokyo, where some winged and a few wingless viviparous females were observed in the fissures of the bark of the *Pinus* on October 26, 1919. It is quite inactive, attended by ants, and, the wingless fomales have the habit of moving the antennae rapidly and almost continuously.

Stomaphis yanonis Takah.

The Dobutsugaku-Zasshi (Zool. Mag. Tokyo), vol. xxx, 359 p. 369 (1918).

(Host plant)

Celtis sinensis: the stems, especially the basal parts, are attacked.

(Season when the insect is common)

(Distribution)

This taphis has been recorded from India and Japan (Tokyo, Sapporo, etc.) but never collected in Formosa.

Eulachnus piniformosanus Takah.

(Host plant)

Pinus sp.: the leaves are attacked.

(Season when the species is abundant)

Near Taihoku this species is not uncommon from the last of September until about the beginning of March, occasionally occurring in large numbers. However its numbers are greatly reduced from about May throughout August, during which period it is often quite difficult to detect it in the field.

(Winged viviparous female)

The winged forms are very rare, although they may make their appearance at any season.

(Male and oviparous female)

Near Taihoku this species is continuously viviparous throughout the year, not producing the sexual forms even in the winter.

(Intermediate)

A few intermediates, which are not provided with wings, but the thorax are developed as in the winged forms, are sometimes produced.

(Habit)

This species does not group densely and walks very actively when disturbed. The head is directed downwards when at rest.

(Distribution)

Formosa: Taihoku, Kagi.

Stomaphis quercus (L.)

(Host plant)

Quercus variabilis: the stems are attacked.

(Season when the insect is common)

Near Tokyo this aphis was observed not uncommonly from the middle of

Nippolachnus piri Mats.

(Host plants)

A. Summer host.

Pirus serotina : the lower surfaces of the leaves, along the midribs, are attacked.

This insect is present on this plant from about the middle of May until the last of September.

B. Winter hosts.

Eriobotrya japonica : the lower sides of the leaves, along the midribs, are attacked. The aphis passes the winter on this plant in the egg condition.

Raphiolepis japonica : the aphis seems sometimes to pass the winter months on this plant, since many winged viviparous females and their nymphs were observed on the under surface of the leaves on June 13, 1917, near Tokyo.

(Season when the insect is common)

Near Tokyo this insect is not uncommon each year, sometimes occurring in large numbers on the summer, as well as, on the winter host.

(Winged viviparous female)

The females of the second generation, which migrate to the summer host from the middle of May until the beginning of June, and the sexuparæ, which return to the winter host in the fall, are provided with wings, but those of other generations are always entirely wingless.

(Male and oviparous female)

The winged males and the wingless oviparous females make their appearance on the *Eriobotrya japonica* in October and November. The males are almost identical in colour with the winged viviparous females, differing from them, however, in not secreting white wax from the dorsa. They are not rare, although much scarcer than the females.

(Intermediate)

No intermediates are found among my specimens.

(Notes on the life history near Tokyo)

The eggs hatch about the 20th day of March. The first generation (stem-mother) consists only of the wingless individuals, but the second generation in-

This aphis is rather common near Tokyo, where it is often most abundant in May and June, although their numbers are reduced during the summer.

(Winged viviparous females).

The second, as well as, the third generation consists of both winged and wingless forms, but all others always include only wingless individuals. The sexuparæ are also wingless.

(Male and oviparous female).

The males are apterous, small, and rather flat, with the eyes and rostrum rudimentary and the cornicles absent. The number of molts seems to be scanty.

The oviparous females are wingless, as is common for most of the Aphidinæ and are almost identical in structure and colour with the wingless viviparous female, being provided with a well developed rostrum.

In the vicinity of Tokyo, these sexual forms are produced at the beginning and near the middle of November. The males are scarcer than the females.

(Intermediate)

No intermediates have been noticed.

(Notes on the life history near Tokyo)

The eggs hatch at the beginning of April and the adult stem-mothers, which are wingless, appear during the first half of May. The winged and wingless forms of the second generation attain their adult stage at the last of May or the beginning of June, when they are most abundant. After some wingless viviparous generations are repeated during the summer the sexules are produced in the fall. Each oviparous female produces two or three large eggs, which are yellowish in colour when newly laid, later darkening to black, deposited upon the stem of the host tree.

(Communal life)

This species is usually covered with tents by *Lasius niger*.

(Habit)

It is very inactive in habit, grouping rather densely.

(Distribution)

Japan : Tokyo.

nana on November 12 and 21, 1923, near Taihoku.

(Male and oviparous female)

This aphis is continuously viviparous throughout the year near Taihoku, the sexuales never having been found.

(Intermediate)

No intermediates have been discovered.

(Communal life)

The wingless viviparous females are sometimes found in the nests of *Capritermes nitobei* Shiraki (Termitidae) built around the bases of the stalks of *Bambusa stenostachya*.

(Habit)

This aphis is very inactive, grouping quite densely on the *Bambusa*, with the head directed upwards. It has the habit, when disturbed, of elevating the posterior pair of legs, not dropping to the ground.

(Distribution)

Formosa: Taihoku, Sozan, Shinten, Tainan.

Oregma bambusifoliae Takah.

(Host plants)

Bambusa stenostachya, Bambusa nana, Bambusa sp., Dendrocalamus latiflorus: the lower surfaces of the leaves are attacked.

(Season when the insect is abundant)

This aphis is one of the most common species near Taihoku, where it is most abundant in March and April, its numbers being sometimes greatly reduced from June until September, during which period it is sometimes difficult to detect the aphis in the field when the leaves of the host become very hard.

(Winged viviparous female)

Numerous winged forms make their appearance each year, near Taihoku, from the end of April until the beginning of June. In other months only the wingless forms are seen.

(Male and oviparous female)

This aphis is continuously viviparous all the year, near Taihoku. The

cludes only the winged, the adults of which occur on the *Eriobotrya* from the middle of May to the beginning of June, then migrating to the summer host. The sexuparæ make their appearance from about the 20th day of September to the beginning of October. Each oviparous female deposits about 10 eggs upon the lower side of the leaves these being pale yellowish in colour, with one end pale brownish, when newly deposited, gradually darkening to a deep green, and before hatching both ends changing into blackish.

(Habit)

The aphis has the habit, when slightly disturbed, of dropping to the ground.

(Distribution)

Japan: Tokyo, etc.

Aiceona actinodaphnii Takah.

Host plant.—*Actinodaphne pedicellata:* the lower surface of the leaves and the young twigs are attacked.

Many winged and wingless viviparous females were observed on January 3, 1921, at Urai, near Taihoku, and a few wingless individuals on March 23, 1921, at Kwanshirei, Formosa.

Oregma bambusicola Takah.

(Pl. VIII, B, fig. 13 & Pl. IX, B)

(Host plants)

Bambusa stenostachya, Bambusa nana, Bambusa sp.: the tender stalks and the young shoots are attacked. The leaves are not fed upon.

(Season when the insect is abundant)

This *Oregma* is very common near Taihoku, but is not as common as *Oregma bambusifoliae* Takah., occasionally being abundant at any season.

(Winged viviparous female)

The winged forms are extremely rare near Taihoku, where usually only the wingless viviparous females are seen throughout the year.

Some winged viviparous females were observed in one colony on *Bambusa*

sexes have never been observed.

(Intermediate)

No intermediates have been collected.

(Habit)

This aphis is found grouping, though not densely, on the lower surface, especially along the midribs, of the leaves, with the head directed to all directions. The wingless form has the habit of moving the abdomen from side to side when very slightly, though not strongly, disturbed.

(Distribution)

Formosa: Taihoku, Shirin, Kagi.

Oregma montana v. d. Goot.

Bambusa nana: two or three winged and many wingless viviparous females were observed grouping at the bases of the lower surfaces of the leaves on October 2, 1921, at Urai, Formosa.

Bambusa stenostachya: a few winged and wingless viviparous forms were observed on the young shoots and leaves, near Taihoku, in October and November, 1920 and 1921.

This aphis is quite rare near Taihoku, occurring in very small numbers.

Oregma orientalis Takah.

Host plant.—*Arthraxon ciliaris:* the lower sides of the leaves are attacked.

A few wingless viviparous females were observed grouping densely on the basal parts of the leaves, the head directed toward the base, on July 2, 1920, near Taihoku.

Oregma panicola Takah.

(Pl. IX, A, figs. 1—6)

Host plant.—*Panicum patens;* attackiug the stalk.

Many wingless and winged viviparous females were observed on December 11, 1920, near Taihoku; on January 3, 1921, and January 1, 1922, at Urai; and some wingless ones on April 3, 1921, at Urai. Formosa.

Oregma lanigera (Zehnt.)

(Host plants)

Saccharum officinarum: the lower surfaces of the leaves are attacked, sometimes sufferring severely,

Miscanthus spp.: the lower surfaces of the leaves are attacked.

I transferred wingless viviparous females from the *Miscanthus* to the *Saccharum* or from the *Saccharum* to the *Miscanthus*, with very successful results.

(Season when the insect is abundant)

In Formosa this species is very common, occasionally occurring in great abundance at any season either on the *Miscanthus* or on the *Saccharum*.

(Winged viviparous female)

The winged forms are produced from time to time throughout the year in the colonies feeding on the *Saccharum*, although rather scanty in number They are very rare in those feeding on the *Miscanthus*, however, having been observed on this plant only on May 3, 1920, and on November 1, 8, and 14, 1921, near Taihoku.

(Male and oviparous female)

It is entirely viviparous all the year, without producing the sexual forms.

(Intermediate)

No intermediates have been observed.

(Some notes on the life history)

The nymphal stage of the wingless form lasts for about 10 days, but that of the winged form about two weeks, in July, near Taihoku.

(Communal life)

This aphis and *Aphis miscanthi* Takah. are rarely found grouping together on the *Miscanthus*.

(Habit)

The young nymphs walk about on the host; but the wingless adults are rather sedentary in habit, grouping very densely, with the head directed in indefinite directions. They have the habit, when very slightly, though not strongly, disturbed, of moving the abdomen from side to side for a few times.

(Distribution)

Formosa: Taihoku, Urai, Kwanshirei, Heto, Kagi.
Boko-islands, Koto-island.

Astegopteryx styracicola Takah.

Host plant.—*Styrax formosanum;* producing very large galls.

Near Taihoku the winged forms make their appearance in January to migrate to an unknown plant, leaving the galls on the *Styrax*. Not common in Formosa.

Astegopteryx nekoashi Sasaki.

Host plant.—*Styrax japonicus;* producing galls.

Near Tokyo the winged viviparous females make their appearance about the 10th day of July to migrate to an unknown plant leaving the galls on the *Styrax*. A few winged forms may be seen in the galls as late as the middle of August. Many winged viviparous females, which were probably the sexuparae, were observed on the lower side of the leaves of *Styrax* on October 18, 1918, near Tokyo. This aphis is very common in the vicinity of Tokyo.

Astegopteryx fici Takah.

(Host plants)

Ficus retusa: the lower and upper surfaces of the leaves are attacked.

Ficus wightiana: some wingless viviparous females were observed on the leaves on March 24, 1921, at Koheki, Formosa.

No galls are produced.

(Season when the insect is common)

Near Taihoku this aphis may be found very commonly on *Ficus retusa* at any season, occasionally occurring in great abundance, but its numbers are usually conspicuously reduced during the summer, when the aphis sometimes ceases to produce young.

(Winged viviparous female)

The winged forms are quite rare, having been observed only on Janurary 9, and March 3 and 20, 1922, near Taihoku.

(Male and oviparous female)

It is continuously viviparous throughout the year, no sexuales having been found near Taihoku.

(Intermediate)

No intermediates have been observed.

(Habit)

The wingless forms are black in colour, very hard, and aleurodiform, being completely cemented to the leaf. The young nymphs, however, are yellow and walk about on the leaves of the host plant. The aphis does not group densely, directing the head in indefinite directions.

(Distribution)

Formosa: Taihoku, Kiirun, Toyen, Koheki.

Astegopteryx quercicola Takah.

(Host plant)

Quercus serrata: the lower, and sometimes the upper, surfaces of the leaves are attacked.

No galls are produced. A winged viviparous female was observed laying more than ten nymphs on a leaf of *Colocasia antiquorum* on March 20, 1922, near Taihoku.

(Season when the insect is common)

Near Taihoku this aphis is very common on the *Quercus* all the year, being most abundant in November and December, its numbers sometimes conspicuously reduced from May onwards throughout September.

(Winged viviparous female)

Many winged forms make their appearance from the last of November to the beginning of March. Their nymphs are rather flat, and yellowisn in colour, provided with much white wax on the body.

(Male and oviparous female)

No sexuales occur near Taikoku, where it is continuously viviparous throughout the year.

(Intermediate)

No intermediates have been observed.

(Some notes on the life history near Taihoku)

The wingless adults are black in colour, very hard, and aleurodiform,

being firmly cemented to the leaf. The young nymphs, however, are yellow and walk about on the host plant. Near Taihoku the leaves of the *Quercus serrata* often begin to gradually wither at about January, but the new leaves begin to unfold during the same month, and the young nymphs migrate to the new leaves from the old ones at this seasen.

(Habit)

The nymphs of the winged form have the habit of grouping quite densely like some species of *Oreyma*, but the wingless ones have no such habit. The nymphs of the winged form of *Astegopteryx fici* Takah., unlike those of *A. quercicola*, are rather sporadic.

(Distribution)

Formosa : Taihoku.

Astegopteryx distyfoliæ Takah.

(Host plants)

A. Winter host

Distylium racemosum : the leaves are attacked. Many small galls are produced in the spring by the stem-mothers on the upper, as well as the lower, surfaces of the leaves.

B. Summer hosts.

Quercus glandulifera ; Q. dentata ; Q. crispula ; Quercus sp : the lower surfaces of the leaves are attacked. This aphis is present on these *Querci* from about the middle of June until the last of November, producing no galls, and being most abundant in the fall when the sexuparæ are produced.

(Season when the species is common).

Near Tokyo this aphis is quite numerous, although its numbers are reduced during the summer.

(Winged viviparous female)

The females of the second generation and the sexuparæ are always provided with wings, but those of all other generations are always wingless.

(Male and oviparous female)

The males, as well as the oviparous females, have no wings, but possess a well developed rostrum and legs. These forms are present in very large numbers on the lower surface of the leaves of the *Distylium* from November

until about the 20th day of March of the following year.

(Life history near Tokyo)

The galls start about April, attaining their full growth and development toward the end of May, and there is only one stem-mother in each gall.

The stem-mothers, which are, of course, wingless, begin to produce the young about the middle of May. The adults of the second generation, which are winged, make their appearance about the beginning of June and migrate to the *Quercus*, leaving the galls on the *Distylium*. The females of the third and the succeeding generations on the summer hosts are entirely wingless, black in colour, and aleurodiform, being firmly cemeuted to the leaf. The sexuparæ, which are winged, occur at about the beginning of November and return to the winter host to produce the sexuales on the lower surface of the leaves. The males are not rare. The eggs are yellowish green in colour, not changing to black, and are placed upon the lower surface of the leaves of the *Distylium*.

(Distribution)

Japan : Tokyo.

Astegopteryx cuspidatæ (Essig et Kuw.)

(Host plants)

Quercus dentata ; Q. cuspidata : the young shoots and branches are attacked. This aphis spends the whole life cycle on the *Quercus*, without producing galls. Some wingless viviparous females are sometimes observed in the crevices of the bark on the stems.

(Season when the insect is common)

Near Tokyo this aphis is very common at all seasons, sometimes occurring in large numbers.

(Winged viviparous female)

Many winged forms appear only in May and June.

(Male and oviparous female)

No sexes occur near Tokyo, the species being viviparous even in the winter.

(Intermediate)

No intermediates have been observed.

(Habit)

The wingless forms are firmly cemented to the host, not grouping densely, and are sometimes covered with tents by ants.

The young nymphs walk about on the host plant.

(Distribution)

Japan: Tokyo.

Astegopteryx giganteum Takah.

A winged viviparous female was observed resting on the lower surface of the leaf of *Ficus retusa* on May 9, 1920, near Taihoku.

Astegopteryx japonica Takah.

Many winged and a few wingless viviparous females were observed on the leaves of *Ranunculus sp.*? in July 1919, at Ikegami, near Tokyo.

Aleurodaphis blumeæ v. d. Goot.

(Pl. V, A. fig. 4)

Host plant.—*Blumea chinensis*: the lower surface of the young leaves and the tender stalks are attacked. The infested leaves and stalks are sometimes slightly curled.

Near Taihoku the author has observed the wingless viviparous females on May 16, 1921, and from the beginning of February to the first week of June, 1922. The wingless forms are rather sedentary, but not cemented to the host, grouping not densely.

The winged forms have never been discovered.

Pemphigus borealis Tullgr.

Host plant.—*Populus sp.*, producing galls.

A few winged viviparous females were observed in the galls on September 14, 1917, near Tokyo.

Prociphilus osmanthæ Essig et Kuw.

Host plant.—*Osmanthus aquifolium*, attacking the stem.

Some winged viviparous females and their nymphs were observed on May 22, 1918, near Tokyo.

Nurudea shiraii (Mats.)

Host plant.—*Rhus semialata*, producing galls.

This species is not very common near Taihoku, where the winged viviparous females make their appearance in September to migrate to an unknown plant leaving the galls on the *Rhus*.

Geoica lucifuga (v. d. Goot)

Host plant.—*Saccharum officinarum*, attacking the root.

A few wingless viviparous females were collected by Mr. Ishida in January, 1917, at Shinkwa, Formosa.

Forda species.

Host plant.—*Salvia anthemifolia*, attacking the root.

Many wingless viviparous females were observed on April 9, 1922, at Taihoku.

Paracletus cynodonti (Das)

(Pl. VI, B, figs. 6—9)

Oplismenus sp.: some wingless and a winged viviparous females were observed on January 2, 1922, at Urai, Formosa.

Cynodon dactylon: many wingless viviparous females feeding on the basal parts of the leaves were observed on February 12, 1921, and numerous wingless and a few winged forms were found on April 17 and May 8, 1922, near Taihoku.

Tetraneura javensis v. d. Goot.

Host plant.—*Saccharum officinarum*, attacking the root.

A few wingless viviparous females were collected by Mr. Ishida in Janury, 1917, at Shinkwa, Formosa.

Dryopeia hirsuta Baker.

Host plant.—*Oryza sativa*, attacking the root.

Some wingless viviparous females were collected on March 20, 1914, at Tainan, by Mr. Sawada.

General summary of principal results.

(Host plants)

1. From Formosa more than 3500 species of plants have been recorded, of which about 200 are at present known to be fed upon by aphids in Formosa.

2. Gall-producing species in Formosa are *Nurudea shiraii* Mats, *Astegopteryx styracophila* Kars. and *Astegopteryx styracicola* Takah. These species leave the galls and migrate to unknown plants.

3. The life-histories of *Amphorophora magnoliæ* (Essig et Kuw.), *Astegopteryx distylfoliæ* Takah. and *Nippolachnus piri* Mats., which have the habit of alternating hosts, are known in detail.

4. Near Taihoku, *Rhopalosiphum nymphææ* (L.) inhabits various aquatic plants all the year, without alternating hosts, and is rarely found on *Prunus communis*. *Hyalopterus pruni* (Fak.), near Tokyo, feeds on *Phragmites communis* and *Prunus spp.* during the summer and spends the winter only on *Prunus spp.*, but near Taihoku the insect is found on *Phragmites communis* throughout the year and is also seen on *Prunus spp.* at times.

(Season when the insect is scarce)

Many species are reduced in numbers during the summer when the tender portions of the hosts become scarce or their leaves become hard.

(Winged viviparous female)

The winged forms of *Macrosiphum formosanum* Takah., *Macrosiphum gobonis* Mats., *Myzus persicæ* (Sulz.), *Rhopalosiphum pseudobrassicæ* (Davis), *Toxoptera aurantii* (Boyer), *Aphis spp.*, *Hyalopterus pruni* (Fab.), *Neophyllaphis podocarpi* Takah., etc. are common in Formosa, as in Japan, and near Taihoku

they make their appearance at almost any season. Those of *Macrosiphoniella tanacetarium* (Koch) and *Dilachnus sp.* are rare in Formosa, as well as in Japan.

(Male and oviparous female)

1. Owing to the absence of the very cold season, the leaves of most plants are green throughout the year in Formosa (except in the high mountain regions), and near Taihoku almost all aphids are continuously viviparous throughout the year, without producing sexual forms.

2. *Callipterus kahawaluokalani* (Kirk.) is the only species in Formosa which is, at present, known to produce the males and oviparous females in the fall and to pass the winter in the egg condition.

3. Some males of *Shivaphis celti* Das and *Myzus persicæ* (Sulz) and an oviparous female of *Neophyllaphis podocarpi* Takah. have been discovered near Taihoku, although these species are always viviparous throughout the year in Formosa.

4. The oviparous females of almost all the Aphidinæ are wingless, but the author has found those of the following species to be provided with wings:

Greenidea kuwanai (Perg.)
G. tenuicorpus (Okaj.)
Cervaphis quercus Takah.
Neophyllaphis podocarpi Takah.

5. The sexuales of most Aphididæ usually occur in the fall or the winter, but the oviparous females of *Cervaphis quercus* Takah. and the sexual forms of *Neophyllaphis podocarpi* Takah. make their appearance from the spring or the summer on. This fact was observed only near Tokyo, not in Formosa.

(Intermediate)

Two types of the brachypterous from have been observed. See "Notes on the brachypterous forms of Aphididæ," p. 131.

(Communal life)

See "Plant-lice and ants," p. 154.

Different species on the same host plant are sometimes found in groups.

The wingless viviparous females of *Oregma bambusicola* Takah. are sometimes found in the nests of *Capritermes nitobei* Shiraki.

Plant-lice and ants.

Some species of *Macrosiphum, Macrosiphoniella, Myzus, Amphorophora, Myzocallis, Greenidea, Astegopteryx*, etc. and gall-inhabiting ones are not attended by ants, but many others are habitually visited by them.

In Formosa probably the most common aphid-attendants are *Polyrhachis dives* Smith and *Crematogaster rogenhoferi* Mayr. These insects construct so called suspended nests around the branches of trees and attend almost any species of the aphid, although the latter ant has never been found in the colonies of *Dilachnus species* and *Eulachnus piniformosanus* Takah. which feed on the *Pinus*. The colony of *Aphis miscanthi* Takah., feeding on the *Miscanthus*, is almost always covered with tents by *Lophomyrmex quadrispinosus* Jerdon subsp. *taivanæ* Forel, and those of *Aphis somei* Essig et Kuw. and *Lachnus thujafoliæ* Theob. are sometimes by *Crematogaster rogenhoferi* Mayr.

Some foreign species of the genus *Paracletus* are found in the nests of ants and are carefully tended by these insects, but the Formosan species, *Paracletus cynodonti* (Das), is not tended by any ants.

Geoica lucifuga (v. d. Goot), which is subteranean in habit like some *Paracletus*, feeding on the root of the *Saccharum officinarum*, is said in Formosa, to be often found in the nests of an ant.

The author, in Formosa, has collected the following aphidicolous ants which were kindly identified by Dr. Wheeler of North America:

(1) *Crematogaster popohana* Forel, attending *Aphis gossypii* Glove. var. *callicarpæ* Takah.

(2) *Crematogaster rogenhoferi* Mayr., attending *Aphis miscanthi* Takah., *Aphis somei* Essig et Kuw, *Aphis pomi* De Geer, *Aphis shirakii* Takah., *Aphis malvæ* Koch, *Aphis gossypii* Glove. var. *callicarpæ* Takah, *Hyalopterus pruni* (Fab.), *Greenidea ficicola* Takah., *Tuberolachnus viminalis* (Fonsc.), *Lachnus thujafoliæ* Theob., *Shivaphis celti* Das, *Astegopteryx fici* Takah., *Aleurodaphis blumeæ* v. d. Goot, etc.

(3) *Camponotus* (*Myrmoturba*) *friedæ* Forel var. *amia* Forel, attending *Lachnus thujafoliæ* Theob.

(4) *Camponotus* (*Myrmoturba*) *barbatus* Roger subsp. *albosparsus* Forel, attending *Oregma bambusifoliæ* Takah,

(5) *Pristomyrmex japanicus* Forel, attending *Oregma bambusifoliæ* Takah.

(6) *Lophomyrmex quadrispinosus* Jerdon subsp. *taivanæ* Forel, attending *Aphis miscanthi* Takah. and *Aphis malvæ* Koch.

(7) *Lophomyrmex quadrispinosus* Jerdon (very near the typical form), attending *Aphis gossypii* Glove var. *callicarpæ* Takah.

(8) *Tetramorium guineense* Fabr., attending *Oregma lanigera* (Zehnt.)

(9) *Polyrhachis dives* Smith, attending *Aphis saliceti* Kalt., *Aphis gossypii* Glove, *Aphis gossypii* Glove var. *callicarpæ* Takah., *Aphis pomi* De Geer, *Aphis medicaginis* Koch, *Aphis lilii* Licht?, *Aphis somei* Essig et Kuw., *Toxoptera aurantii* (Boyer), *Brachycolus heraculei* Takah., *Brachysiphoniella gramini* Takah. *Shivaphis celti* Das., *Cervaphis quercus* Takah., *Dilachnus species?*, *Eulachnus piniformosanus* Takah., *Oregma bambusifoliæ* Takah., *Oregma bambusicola* Takah., *Oregma lanigera* (Zehnt.), *Oregma orientalis* Takah., etc.

Food plant catalogue of the Aphididæ in Formosa.

The majority of species of plant-lice are confined to certain definite food plants, although some are conspicuously polyphagous, and the determination of any one species is often more easy when its host plant is known. This catalogue has been compiled for the convenience of the determination of the Formosan Aphididæ.

The names of all the plants upon which the Formosan Aphididæ are known to occur in Formosa are alphabetically arranged.

ound in

Acanthopanax aculeatum Seem. (Araliaceæ)
Aphis gossypii Glov.

Acer sp. (Sapindaceæ)
Myzus persicæ (Sulz.)
Periphyllus formosanus Takah.

Actinodaphne pedicellata Hay. (Laurineæ)
Aiceona actinodaphnii Takah.

Aeschynomene indica L. (Leguminosæ)
Aphis medicaginis Koch.

Allium fistulosus L. (Liliaceæ)
Fullawayella formosana Takah.

Allium scorodoprasum L. var. viviparum Regel.
Fullawayella formosana Takah.

Alnus formosana (Burkill). (Cupuliferæ)
Greenidea sp.
Myzocallis pseudoalni Takah.

Alopecurus æqualis Sobol. (Gramineæ)
Macrosiphum alopecuri Takah.

Alpinia speciosa K. Schum. (Scitaminеæ)
Pentalonia nigronervosa Coq.

Apium graveolens L. (Umbelliferæ)
Brachycolus heraculei Takah.

Aralia spinosa L. (Araliaceæ)
Cavariella araliæ Takah.

Arctium lappa L. (Compositæ)
Macrosiphum gobonis Mats.

Ardisia sieboldi Miq. (Myrsineæ)
Toxoptera aurantii Boyer.

Artemisia capillaris Thuub. (Compositæ)
Cerosipha species.
Macrosiphoniella formosartemisiæ Takah.
Macrosiphum neoartemisiæ Takah.

Artemisia vulgaris L. var. indica Max.
Aphis kurosawai Takah.
Capitophorus formosartemisiæ Takah.
Cryptosiphum artemisiæ Buckt.
Macrosiphoniella tanacetarium (Koch)
Rhopalosiphum lahorensis Das.

Arthraxon ciliaris Beauv. (Gramineæ)
Myzus arthraxonis Takah.
? Oregma panicola Taka.
Oregma orientalis Takah.

Asclepias curassavica L. (Asclepiadeæ)
Aphis nerii Boyer.

Astragalus sinicus L. (Leguminosæ)
Aphis medicaginis Koch.

Bambusa sp. (Gramineæ)
Aphis bambusæ Full.
Myzocallis bambusifoliæ Takah.
Oregma bambusicola Takah.
Oregma bambusifoliæ Takah.
Phyllaphoides bambusicola Takah.

Bambusa nana Boxb.
Aphis bambusæ Full.
Oregma bambusicola Takah.

Oregma bambusifoliæ Takah.
Oregma montana v. d. Goot.

Bambusa stenostachya Hack.
Aphis bambusæ Full.
Myzocallis bambusicola Takah.
Oregma bambusicola Takah.
Oregma bambusifoliæ Takah.
Oregma montana v. d. Goot.
Phyllaphoides bambusicola Takah.

Bidens pilosa L. (Compositæ)
Aphis malvoides v. d. Goot?

Bischoffia javanica Bl. (Euphorbiaceæ)
Aphis somei Essig et Kuw.

Blumea chinensis Dc. (Compositæ)
Aleurodaphis blumeæ v. d. Goot.

Bœhmeria nivea Hook. et Ann. (Urticaceæ)
Myzus boehmeriæ Takah.

Bothriospermum tenellum F. (Borragineæ)
Anuraphis helichrysi Kalt.

Brassica spp. (Cruciferæ)
Myzus persicæ Sulz.
Rhopalosiphum pseudobrassicæ Davis.

Bridelia ovata Decne (Euphorbiaceæ)
Macrosiphoniella citricola v. d. Goot.

Callicarpa formosana Rolfe (Verbenaceæ)
Aphis gossypii Glov. var. callicarpæ Takah.

Capsella bursa-pastoris Mœnch (Cruciferæ)
Myzus persicæ Sulz.
Rhopalosiphum pseudobrassicæ Davis.

Celtis nervosa Hemsl. (Urticaceæ)
Shivaphis celti Das.

Chenopodium album L. (Chenopodiaceæ)
Myzus persicæ Sulz.

Chrysanthemum sp. (Compositæ)
Myzus persicæ Sulz.

Chrysanthemum coronarium L.
Rhopalosiphum pseudobrassicæ Davis.

Chrysanthemum sinense Sab.
Macrosiphoniella sanborni Gillette.

Cinnamomum camphora Nees. et Eb3. (Laurineæ)
Macrosiphoniella citricola v. d. Goot.

Cirsium japonicum Dc. (Compositæ)
Macrosiphum cirsicola Takah.
Macrosiphum gobonis Mats.

Citrus spp. (Rutaceæ)
Aphis somei Essig et Kuw.
Aphis tavaresi Del Guerc.
Toxoptera aurantii Boyer.

Clerodendron spp. (Verbenaceæ)
Aphis malvæ Koch.

Clerodendron cyrtophyllum Turcz.
Aphis malvæ Koch.

Cocos nucifera L. (Palmæ)
Cerataphis lataniæ Boisd.

Coffea arabica L. (Rubiaceæ)
Toxoptera aurantii Boyer.

Colocasia antiquorum Schot. (Aroideæ)
Aphis gossypii Glov.

Crepis japonica Bentn. (Compositæ)
Macrosiphum gobonis Mats.

Cucumis spp. (Cucurbitaceæ)
Aphis malvæ Koch.

Cynodon dactylon Pers. (Gramineæ)
Paracletus cynodonti Das.

Cyperus iria L. (Cyperaceæ)
Aphis sp.

Cyperus rotundus L.
Vesiculaphis caricis Full.

Dendrocalamus latiflorus Munro. (Gramineæ)
Oregma bambusifoliæ Takah.
Myzocallis bambusicola Takah.

Dichrocephala latifolia Dc. (Compositæ)
Aphis gossypii Glov.

Drosera lourerii Hook. et Arn. (Droseroceæ)
Aphis droseræ Takah.

Duranta plumieri Jacq. (Verbenaceæ)
Aphis malvæ Koch.
Myzus persicæ Sulz.

Eupatorium formosanum Hay. (Compositæ)
Anuraphis helichrysi Kalt.

Euscaphis japonica Pax, (Sapindaceæ)
Amphorophora indicum v. d. Goot.

Ficus foveolata Wall. (Urticaceæ)
Toxoptera aurantii Boyer.

Ficus obscura Blume.
Macrosiphoniella citricola v. d. Goot.
Greenidea ficicola Takah.

Ficus retusa L.
? Astegopteryx giganteum Takah.
Greenidea ficicola Takah.
Toxoptera aurantii Boyer.
Astegopteryx fici Takah.

Ficus wichtiana Wall.
Aphis sp.
Aphis ficicola Takah.
Astegopteryx fici Takah.

Ficus sp.
Toxoptera aurantii Boyer.

Glochidion fortunei Muell. (Euphorbiaceæ)
Aphis pomi De Geer.

Glochidion hongkongense Muell.
Aphis pomi De Geer.

Glycine soja Benth. (Leguminoseæ)
Aphis medicaginis Koch.

Gnaphalium japonicum Thunb. (Compositæ)
Aphis gossypii Glov.

Gnaphalium multiceps Wall.
Macrosiphum ambrosiæ Thomas.

Gossypium herbaceum L. (Malvaceæ)
Aphis gossypii Glov.

Gramineæ, a plant of this family.
Aphis formosanus Takah.
Aphis maidis Fitch.

Hemerocallis furva L. (Liliaceæ)
Myzus hemerocallis Takah.

Heracleum barbatum Led. (Umbelliferæ)
Brachycolus heraculei Takah.

Heptapleurum octophyllum Benth. (Araliaceæ)
Aphis somei Essig et Kuw.

Hibiscum abelmoschus L. (Malvaceæ)
Aphis gossypii Glov.
Myzus persicæ Sulz.

Hibiscus rosa-sinensis L.
Aphis gossypii Glov.

Hibiscus tiliaceus L.
Aphis gossypii Glov.

Hibiscus sp.
Aphis gossypii Glov.

Humulus japonicus S. et K. (Urticaceæ)
Phorodon humuli Schrank.

Ipomæa batatas Poir. (Convolvulaceæ)
Myzus persicæ Sulz.

Jussiæa suffruticosa L. (Onagrarieæ)
Aphis pomi De Geer.

Justicia procumbens L. (Acanthaceæ)
Aphis gossypii Glov.

Lactuca brevirostris Champ. (Compositæ)
Amphorophora oleraceæ v. d. Goot.
Macrosiphum formosanum Takah.

Lactuca debilis Benth. et Hook.
Amphorophora oleraceæ v. d. Goot.
Macrosiphum debilis Takah.
Macrosiphum formosanum Takah.

Lactuca formosana Max.
Macrosiphum formosanum Takah.

Lactuca gracilis Dc.
Macrosiphum formosanum Takah.

Lactuca oldhami
Myzus persicæ Sulz.

Lactuca scariola L.
Amphorophora oleraceæ v. d. Goot.
Macrosiphum formosanum Takah.

Lactuca thunbergiana Max.
Macrosiphum formosanum Takah.

Lagerstrœmia indica L. (Lythrarieæ)
Callipterus kahawaluokalani Kirk.

Lagerstrœmia spp.
Callipterus kahawaluokalani Kirk.

Lasianthus sp. (Rubiaceæ)
Macrosiphoniella citricola v. d. Goot.

Leersia hexandra Swartz. (Gramineæ)
Brachysiphoniella gramini Takah.

Leonurus sibiricus L. (Labiatæ)
Toxoptera leonuri Takah.

Lilium sp. (Liliaceæ)
Aphis lilii Licht?

Liquidambar formosana Hance. (Hammamelideæ)
Aphis gossypii Glov.

Lithocarpus uraiana Hay. (Cupuliferæ)
Eutrichosiphum lithocarpi Maki.

Lobelia radicans Thunb. (Campanulaceæ)
Aphis sp.

Lonicera japonica Thunb. (Caprifoliaceæ)
Trichosiphonaphis polygoniformosanus Takah.

Macaranga tanarius Muell. (Euphorbiaceæ)
Toxoptera aurantii Boyer?

Mariscus sp. (Cyperaceæ)
Aphis sp.

Mazus japonicus O. (Scrophularineæ)
Fullawayella violæ Perg.

Melastoma candidum Don. (Melastomaceæ)
Aphis shirakii Takah.

Meliosma rhoifolia Max. (Sabiaceæ)
Greenidea taiwana Takah.

Mentha arvensis L. var, vulgaris Benth (Labiatæ)
Myzus menthæ (Buckt.)

Miscanthus spp. (Gramineæ)
Aphis miscanthi Takah.
Macrosiphum granarium Kirby.
Oregma lanigera Zehnt.

Mosla formosana Max. (Labiatæ)
Aphis gossypii Glov.

Murraya exotica L. (Rutaceæ)
Macrosiphoniella citricola v. d. Goot.
Toxoptera aurantii Boyer.

Musa formosana Hay. (Scitamineæ)
Pentalonia nigronervosa Coq.

Musa sapientum L.
Pentalonia nigronervosa Coq.

Nelumbo nucifera Gaertn. (Nymphæaceæ)
Rhopalosiphum nymphaeæ L.

Nicotiana tabacum L. (Solanaceæ)
Myzus persicæ Sulz.

Nymphæa sp. (Nymphæaceæ)
Rhopalosiphum nymphaeæ L.

Oenanthe stolonifera Dc. (Umbelliferæ)
Brachycolus heraculei Takah.

Oplismenus sp. (Gramineæ)
Paracletus cynodonti Das.

Oryza sativa L. (Gramineæ)
Aphis maidis Fitch.
Dryopeia hirsuta Baker.
Macrosiphum granarium Kirby.
Rhopalosiphum avenæ Fab.

Pæderia tomentosa Blume. (Rubiaceæ)
Macrosiphum pæderiæ Takah.

Panicum patens S. (Gramineæ)
Oregma panicola Takah.

Papaver somniferum L. (Papaveraceæ)
Aphis gossypii Glov.
Myzus persicae Sulz.
Rhopalosiphum avenæ Fab.

Petasites tricholobus Fr. (Compositæ)
Myzus persicæ Sulz.

Phragmites communis Trin. (Gramineæ)
Hyalopterus pruni Fab.

Pinus massoniana Lamb. (Coniferæ)
Dilachnus pinidensiflorae (Essig et Kuw)
Dilachnus sp.
Eulachnus piniformosanus Takah.
Eulachnus rileyi Williams?

Pinus thunbergii Parl.
Dilachnus sp.
Dilachnus pinidensiflorae Essig et Kuw.
Eulachnus piniformosanus Takah.

Pinus sp.
Dilachnus piniformosanus Takah.
Dilachnus sp.

Pirus serotina Rhd. (Rosaceæ)
Aphis gossypii Glov
Aphis pomi De Geer.

Pistia stratiotes L. var. asiatica Engl. (Aroideæ)
Rhopalosiphum nymphaeæ L.

Pisum arvense L. (Leguminosæ)
Macrosiphum pisi Kalt.
Myzus persicæ Sulz.

Pisum sativum L.
Macrosiphum pisi Kalt.
Myzus persicæ Sulz.

Pittosporum tobira Ait. (Pittosporeæ)
Aphis somei Essig et Kuw.

Plantago major L. (Plantagineæ)
Aphis gossypii Glov.

Podocarpus macrophylla Don. (Coniferæ)
Neophyllaphis podocarpi Takah.

Podocarpus nageia R. Br.
Neophyllaphis podocarpi Takah.

Pollia japonica Thunb. (Commelinaceæ)
Amphorophora sp.

Polygonum chinensis L. (Polygonaceæ)
Myzus formosanus Takah.

Polygonum hydropiper L.
Capitophorus hippophæs Koch.

Polygonum lapathifolium L.
Capitophorus hippophæs Koch.

Polygonum multiflorum Thunb.
Aphis somei Essig et Kuw.

Polygonum perfoliatum L.
Trichosiphonaphis polygoniformosanus Takah.

Polypodiaceæ, a plant of this family.
Myzus polypodicola Takah.

Polystichum sp. (Polypodiaceæ)
Myzus polypodicola Takah.
Myzus woodwardiæ Takah.

Premna formosana Max. (Verbenaceæ)
Aphis malvæ Koch.

Prunus communis Huds. (Rosaceæ)
Rhopalosiphum nymphaeæ L.

Prunus mume S. et Z.
Rhopalosiphum avenæ Fab.

Prunus persicæ Stokes.
Hyalopterus pruni Fab.
Myzus momonis Mats?
Myzus persicæ Sulz.
Myzus tropicalis Takah.

Psidium guyava L. (Myrtaceæ)
Aphis gossypii Glov.
Greenidea formosanum Maki.
Myzus persicæ Sulz.

Punica granatum L. (Lythrariæ)
Aphis gossypii Glov.?

Quercus dentata Thunb. (Cupuliferæ)
Myzocallis querciformosanus Takah.

Quercus serrata Thunb.
Cervaphis quercus Takah.
Greenidea quercifoliæ Takah.
Astegopteryx quercicola Takah.

Quercus sp.
Greenidea nigrofasciatum Maki.
Greenidea nigrum Maki.

Ranunculus sceleratus L. (Ranunculaceæ)
Rhopalosiphum pseudobrassicæ Davis.

Rhaphanus sativus L. (Cruciferæ)
Myzus persicæ Sulz.
Rhopalosiphum pseudobrassicæ Davis.

Rhodomyrtus tomentosa Wight. (Myrtaceæ)
Greenidea formosana Maki.

Rhus javanica L. (Anacardiaceæ)
Aphis somei Essig et Kuw.
Nurudea shiraii Mats.

Rosa spp. (Rosaceæ)
Macrosiphum rosæ L.

Rubus sp. (Rosaceæ)
Macrosiphum rosæ L.?

Rubus sp. (Rubus fraxinifolius Poir?)
Neophorodon rubi Takah.

Rumex crispus L. (Polygonaceæ)
Aphis rumicis L.

Saccharum officinarum L. (Gramineæ)
Geoica lucifuga Zehnt.
Oregma lanigera Zehnt
Tetraneura javensis v. d. Goot.

Sagittaria sagittifolia L. var sinensis Mak. (Alismataceæ)
Rhopalosiphum nymphaeæ L.

Salix warburgii O. Seem. (Salicineæ)
Aphis gossypii Glov?
Aphis saliceti Kalt.
Cavariella bicaudata Essig et Kuw.
Cavariella neocapræ Takah.
Toxoptera aurantii Boyor.
Tuberolachnus viminalis Boyer.

Salix sp.
Cavariella bicaudata Essig et Kuw.

Salvia authemifoliæ R. Br. (Labiatæ)
Forda sp.

Salvia scapiformis Hance, var. pinnata Hay.
Aphis gossypii Glov.

Sapium sebiferum Roxb. (Euphorbiaceæ)
Aphis somei Essig et Kuw.

Saussurea affinis Spreng. (Compositæ)
Macrosiphum gobonis Mats.

Scolopia crenata Clos. (Flacourtiaceæ)
Toxoptera aurantii Boyer.

Siegesbeckia orientalis L. (Compositæ)
Rhopalosiphum lahorensis Das.

Smilax chinensis L. (Liliaceæ)
Aphis smilacifoliæ Takah.
Macrosiphum smilacifoliæ Takah.

Solanum melongena L. (Solanaceæ)
Aphis gossypii Glov.
Myzus persicæ Sulz.

Solanum nigrum L.
Aphis rumicis L.

Sonchus arvensis L. (Compositæ)
Amphorophora oleraceæ v. d. Goot.
Amphorophora sonchifoliæ Takah.
Macrosiphum formosanum Takah.

Sonchus oleraceus L.
Amphorophora oleraceæ v. d. Goot.
Macrosiphum formosanum Takah.

Sorghum vulgare Pers. (Gramineæ)
Aphis formosanus Takah.

Stellaria aquatica Scop. (Caryophylleæ)
Aphis nasturtii Koch?
Myzus persicæ Sulz.

Stellaria uliginosa L.
Aphis nasturtii Koch?

Styrax suberifolium Hook et Arn. (Styraceæ)
Astegopteryx styracicola Takah.
A. styracophila Karsch.

Taraxacum platycarpum A. Dahlst. (Compositæ)
Macrosiphum formosanum Takah.

Thea caudata Wall. (Ternstrœmiaceæ)
Toxoptera aurantii Boyer.

Thea chinensis Sims.
Toxoptera aurantii Boyer.

Thuja orientalis L. (Coniferæ)
Lachnus thujafoliæ Theob.

Trachelospermum jasminoides L. (Apocynaceæ)
Eutrichosiphum minutum Takah.

Triticum vulgare Vill. (Gramineæ)
Aphis maidis Fitch.

Vernonia chinensis L. (Compositæ)
Anuraphis helichrysi Kalt.

Viburnum formosanum Hay. (Caprifoliaceæ)
Aphis somei Essig et Kuw.

Viburnum odoratissimum Kerr.
Toxoptera aurantii Boyer.

Vicia faba L. (Leguminosæ)
Aphis medicaginis Koch.

Viola sp. (Violoceæ)
Fullawayella violæ Pergand.

Vitex trifolia L. var, unifoliolata Schauer (Verbenaceæ)
Aphis gossypii Glov.

Wikstrœmia indica C. A. May (Thymelaeaceæ)
Aphis medicaginis Koch.

Woodwardia radicans Sm. (Polypodiaceæ)
Myzus woodwardiæ Takah.

Zea mays L. (Gramineæ)
Aphis maidis Fitch.

(Host plants unknown.)
Amphorophora formosana Takah.
Macrosiphum taiwanum Takah.

Plate I.

(A)

Myzus arthraxonis Takah.
(Wingless viviparous female)
1——Head.
2——Cauda.

Macrosiphum smilacifoliæ Takah.
(Wingless viviparous female)
3—— Head.
4——Cornicle.

Macrosiphoniella citricola van der Goot.
(Wingless viviparous female collected on *Lasianthus sp.*)
5——Head.
6——Cauda.
7——Cornicle.

Toxoptera aurantii (Boyer)
(Wingless viviparous female collected on *Ficus sp.*)
8——Cornicle.
9——Cauda.
10——Head.

Amphorophora sonchifoliæ Takah.
(Wingless viviparous female)
12—— Cornicle.

(B)

Macrosiphum taiwanum Takah.
(Wingless viviparous female)
1——Cornicle.
2——Cauda.
3——Diagram of the markings on the dorsum.
4—— Head.

Neophorodon rubi Takah.
(Wingless viviparous female.)
5——Head.
6——Cornicle.
7——Cauda.
(Winged viviparous female)
8——base of antenna.

Amphorophora formosana Takah.
(Wingless viviparous female)
9——Head.
10——Cauda.
11——Cornicle.

PLATE I.

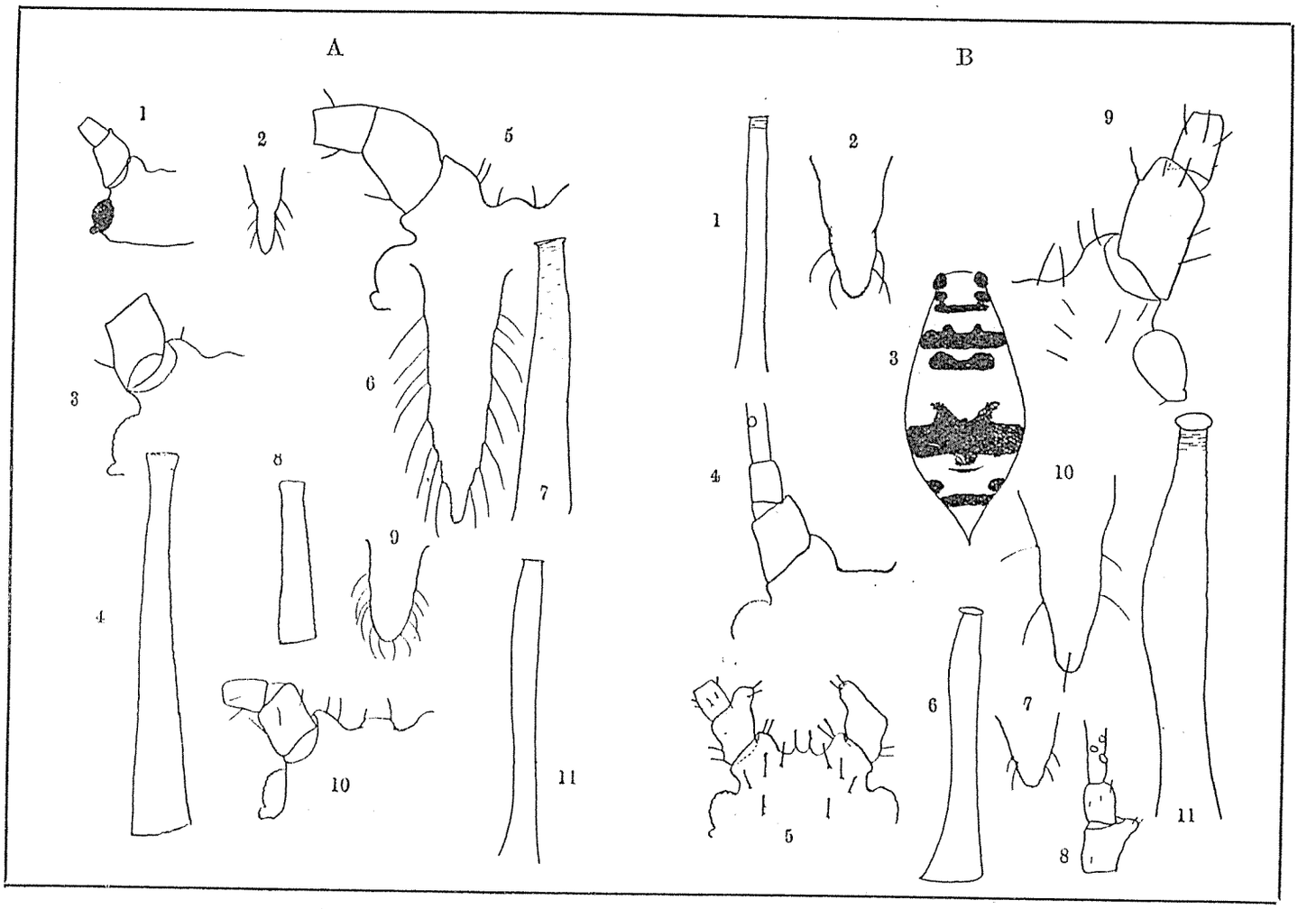


PLATE II.

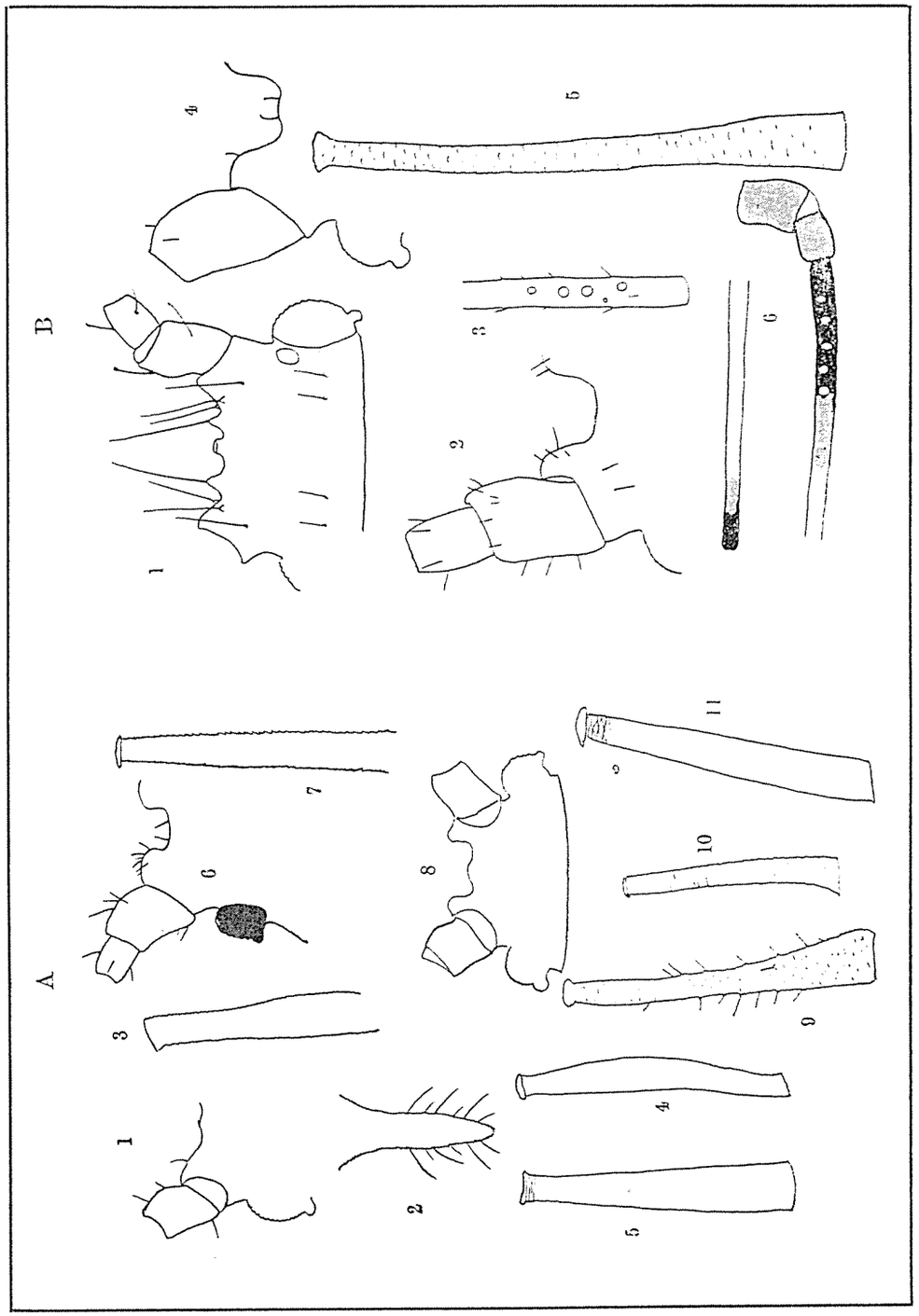


Plate II.

(A)

Macrosiphoniella formosartemisiæ Takah.
(Winged viviparous female)
1——Head.
2——Cauda.
3——Cornicle.

Macrosiphoniella citricola v. d. Goot.
(Winged viviparous female)
5——Cornicle.

Amphorophora sonchifoliæ Takah.
(Winged viviparous female)
4——Cornicle.

Myzus tropicalis Takah.
(Wingless viviparous female)
6——Head.
7——Cornicle.

Trichosiphonaphis polygoniformosanus Takah.
(Collected on *Lonicera japonica*).
(Wingless viviparous female)
8——Head.
9——Cornicle.

Aphis species (on *Mariscus sp.*)
(Wingless viviparous female)
J ——Cornicle.

Macrosiphum pœderiæ Takah.
(Winged viviparous female)
11——Cornicle.

(B)

Myzocallis quercicola Mats.
(Winged viviparous female)
1——Head.

Macrosiphum rosæ L?
(Wingless viviparous female collected on *Rubus sp.*)
2——Head.
3——base of the 3rd antennal joint.

Macrosiphum cirsicola Takah.
(Wingless viviparous female)
4——Head.
5——Cornicle.

Myzocallis bambusifoliae Takah.
(Winged viviparous female)
6——Antenna

PLATE III.

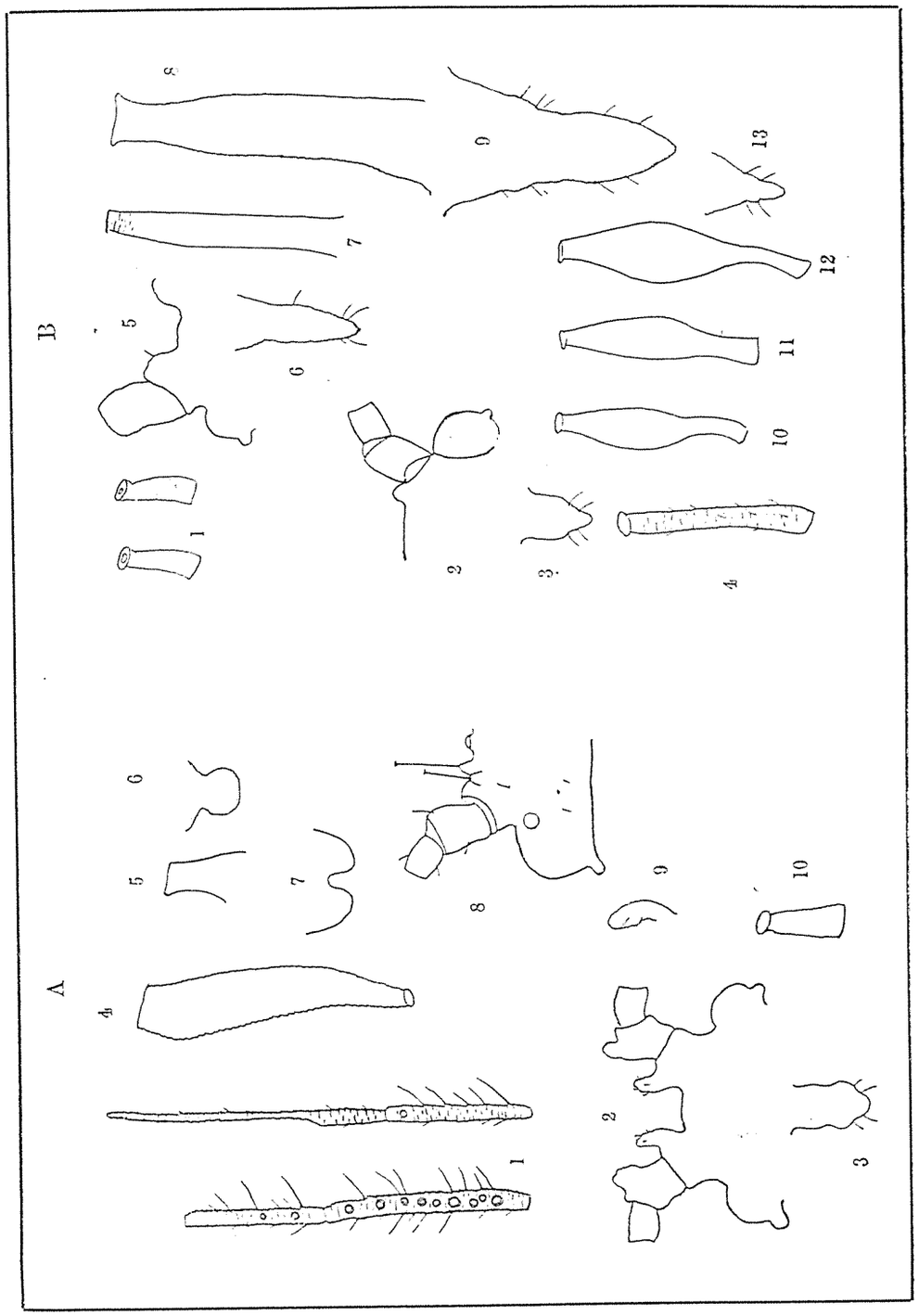


Plate III.

(A)

Aphis somei Essig et Kuw.
(Winged viviparous female)
1——Antenna.

Akkaia polygoni Takah.
(Wingless viviparous female).
2——Head.
3——Cauda.
4——Cornicle.

Myzocallis yokoyamai Takah.
(Winged viviparous female)
5——Cornicle.
6——Cauda.
7——Anal plate.
8——Head.

Aphis species.
(Wingless viviparous female collected on *Cyperus*)
9——Cauda.
10——Cornicle.

(B)

Aphis species.
(Wingless viviparous female collected on *Lobelia.*)
1——Cornicles.

Trichosiphonaphis polygoniformosanus Takah.
(Winged viviparous female)
2——Head.
3——Cauda.
4——Cornicle.

Amphorophora species (on *Pollia joponica*)
(Wingless viviparous female)
5——Head.
6——Cauda.
7——Cornicle.

Amphorophora indicum (v. d. Goot.)
(Wingless viviparous female)
8——Cornicle.
9——Cauda.

Amphorophora hydrangeæ (Mats.)
(Winged viviparous female)
10-2—Cornicles.
13——Cauda

PLATE IV.

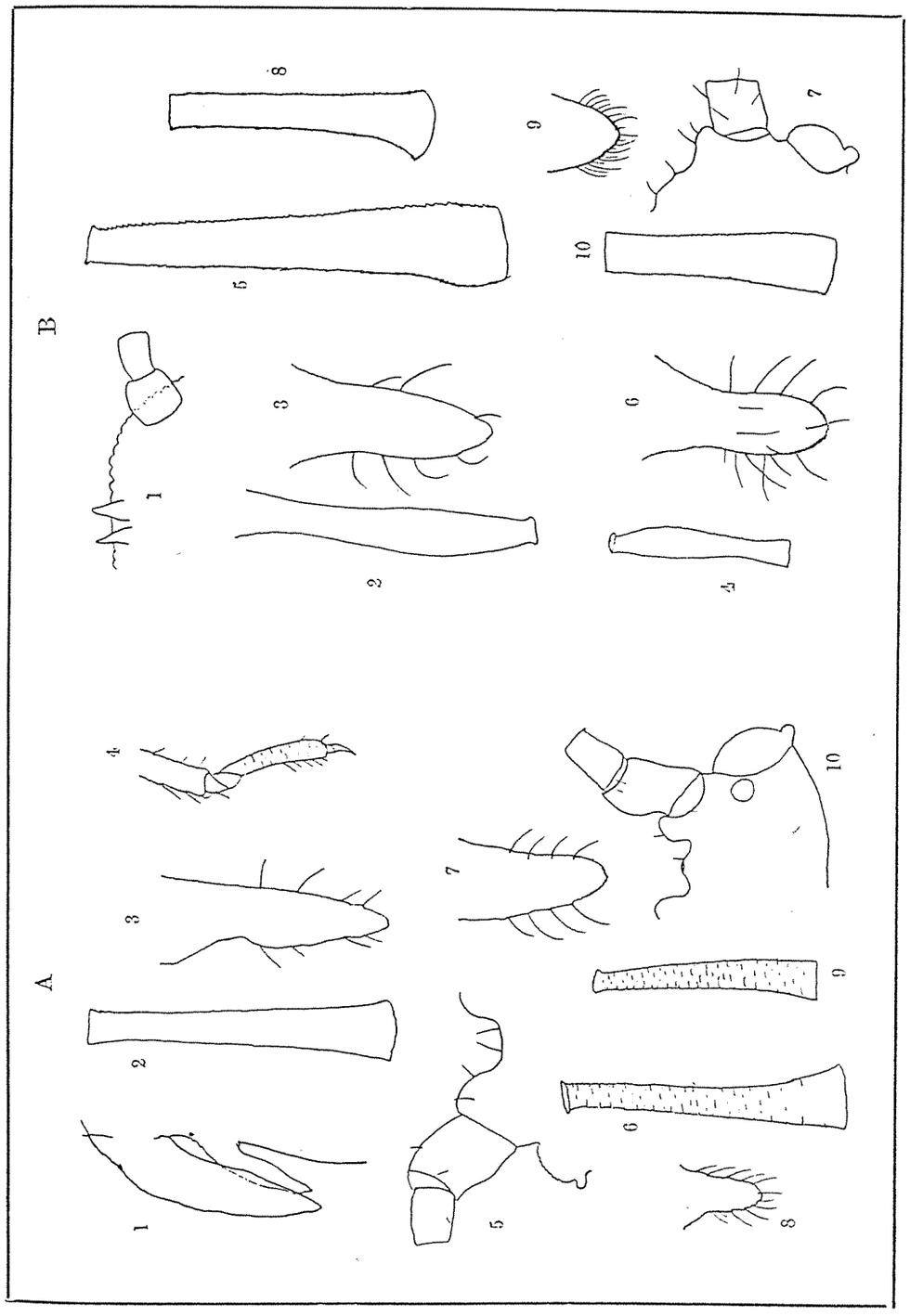


Plate IV.

(A)

Macrosiphum formosanum Takah.

1——Wings of a brachypterous female.

Macrosiphum debilis Takah.

(Winged viviparous female)

2——Cornicle.
3——Cauda.
4——Hind tarsi.

Macrosiphum ibotum Essig et Kuw.

(Wingless oviparous female)

5——Head.
6 — Cornicle.
7——Cauda.

(Winged male)

8 — Cauda.
9——Cornicle.
10——Head.

(B)

Cerataphis latanece Boisd.

(Wingless viviparous female)

1——front of head.

Amphorophora oleraceæ (v. d. Goot)

(Wingless viviparous female)

2——Cornicle.
3——Cauda.

Fullawayella formosana Takah.

(Wingless viviparous female)

4——Cornicle.

Aphis nerii Boyer.

(Wingless viviparous female)

5——Cornicle.
6——Cauda.
7——Head.

(Winged viviparous female)

8——Cornicle.

(Nymph of wingless viviparous female)

9——Cauda.
10——Cornicle.

PLATE V.

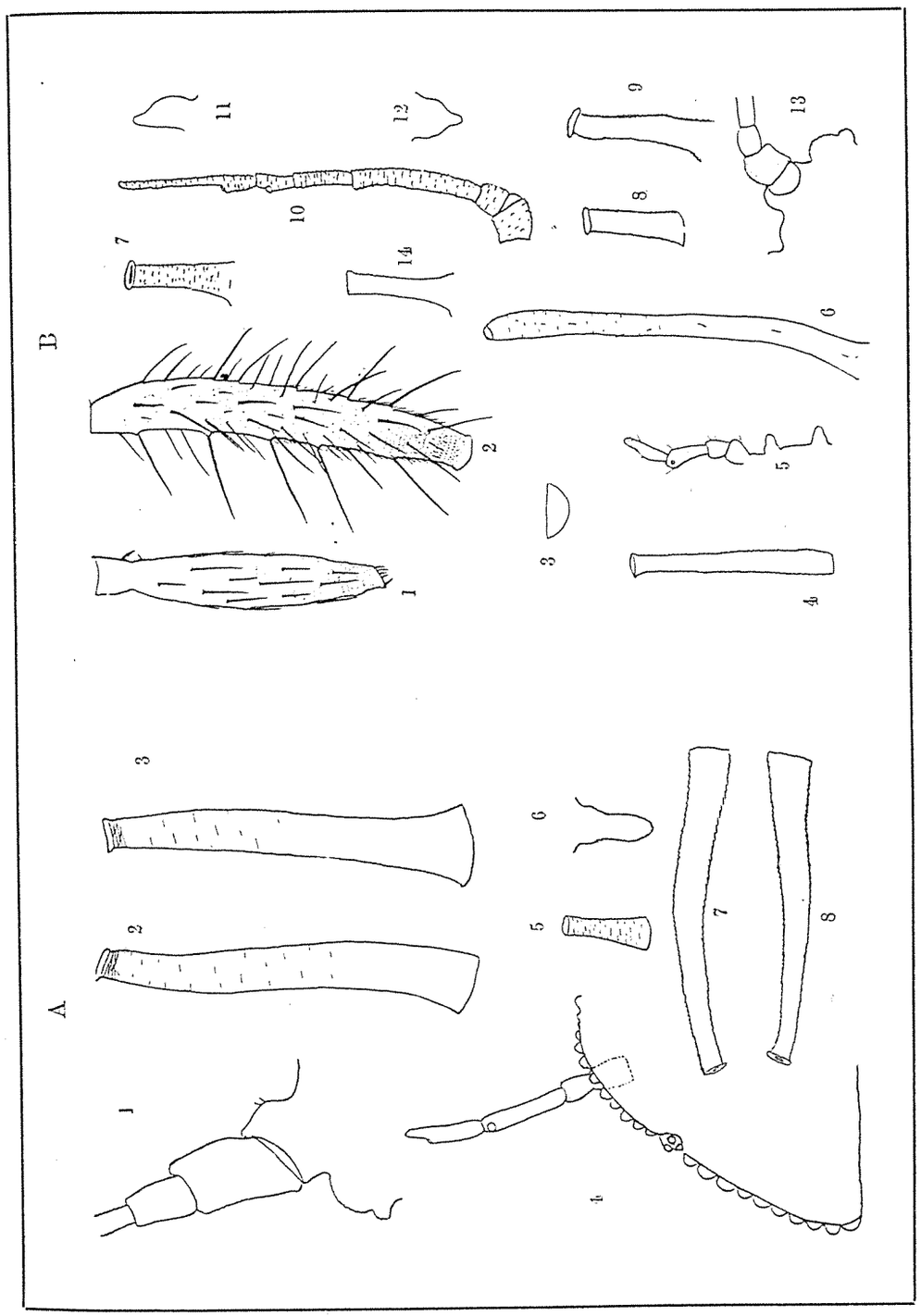


Plate V.

(A)

Macrosiphum pœderiæ Takah.
(Wingless viviparous female)
1——Head.
2-3—Cornicles
Aleurodaphis ilumeæ v. d. Goot.
(Wingless viviparous female)
4——Head.
Aphis kurosawai Takah.
(Wingless viviparous female)
5——Cornicle.
6——Cauda.
Aphis horii Takah.
(Wingless viviparous female)
7-8—Cornicles.

(B)

Greenidea ficicola Takah.
(Wingless viviparous female)
1——Abnormal corniele.
2—— normal conicle.
Cryptosiphum artemisiæ Buckt.
(Winged viviparous female)
3 —— Cauda.
Aphis horii Takah
(Winged viviparous female)
4——Cornicle.
Oregma panicola Takah.
(Wingless viviparous female)
5——Head and antenna.
Cervaphis quercxs Takah.
(Wingless viviparous female)
6——Cornicle.
Myzus momonis Mats?
(Wingless viviparous female)
7-9—Cornicles.
10——Antenna.
11——Cauda (lateral view)
12——Cauda (dorsal view)
13——Head.
(Winged viviparous female)
14——Cornicle.

PLATE VI.

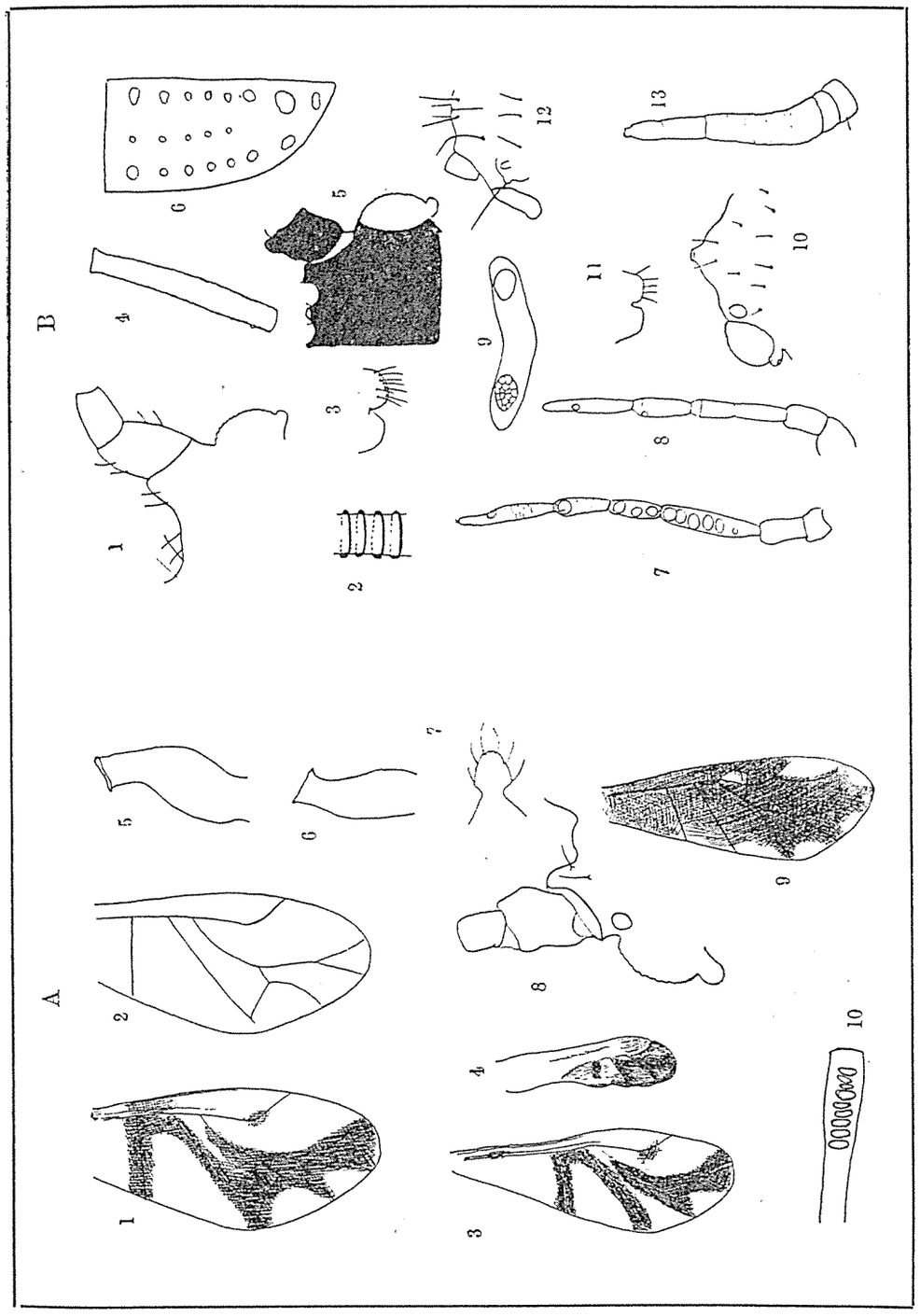


Plate VI.

(A)

Myzocallis kuricola (Mats)

(Winged viviparous female)

1——abnormal fore wing.
2——venation of the same
3——Fore wing of macropterous form.
4——Fore wing of brachypterous form.

Drepanaphis tokyoensis n. sp.

(Winged viviparous female)

5——Cornicle.
6——Cornicle.
7——Cauda.
8——Head.
9——Fore wing.
10——base of the 3rd antennal joint.

(B)

Macrosiphum neoartemisiæ Takah.

1——Head of winged viviparous female.

Oregma panicola Takah.

(Winged viviparous female)

2——Part of antenna.
3——Anal plate.

Amphorophora magnaliæ (Essig et Kuw.)

Collected on *Sambucus racemosa*..

4——Cornicle of male.
5——Head of male.

Paracletus cynodonti (Das)

(Winged viviparous female)

6——Diagram showing the size and position of the groups of wax-pores on the dorsum of the abdomen (left half).
7——Antenna.
9——Wax pores on the metanotum.

(Wingless viviparous female)

8——Antenna.

Astegopteryx fici n. sp.

(Winged viviparous female)

10——Head.
11——Anal plate.
12——Head of nymph.
13——Antenna of nymph.

PLATE VII.

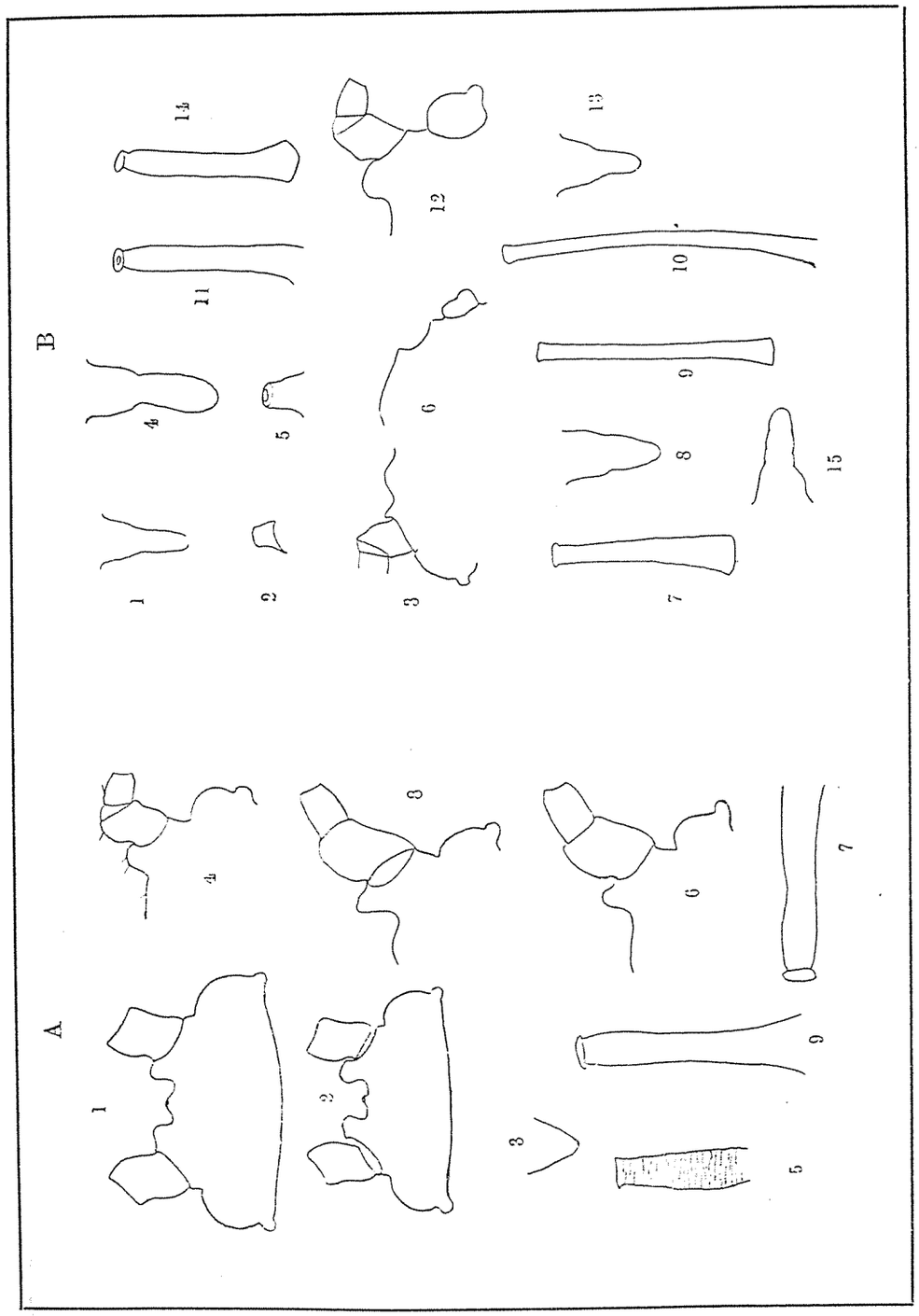


Plate VII.

(A)

Myzus persicæ (Sulz)
(Winged male)
1——Head.
(Winged viviparous female)
2——Head.
(Winged male)
3——Cauda.

Myzus formosanus n. sp.
(Wingless viviparous female)
4——
5——Cornicle.

Pentalonia nigronervosa Coq.
(Wingless viviparous female)
6——Head (on *Musa sapiens*).
7——Cornicle (on *Musa sapiens*).
8——Head (on *Alpinia speciosa*).
9——Cornicle (on *Alpinia speciosa*).

(B)

Brachysiphoniella gramini Takah.
(Winged viviparous female)
1——Cauda.
2——Cornicle.
3——Head.
(Wingless viviparous female)
4——Cauda.
5——Cornicle.
6——Head.

Myzus arthraxonis Takah.
(Wingless viviparous female)
7——Cornicle.
8——Cauda.

Capitophorus formosartimisiæ Takah.
9——Cornicle of winged viviparous female.
10——Cornicle of wingless viviparous female.

Myzus hemerocallis Takah.
(Wingless viviparous female)
11——Cornicle.
12——Head.
13——Cauda.
(Winged viviparous female)
14——Cornicle.
16——Cauda.

PLATE VIII.

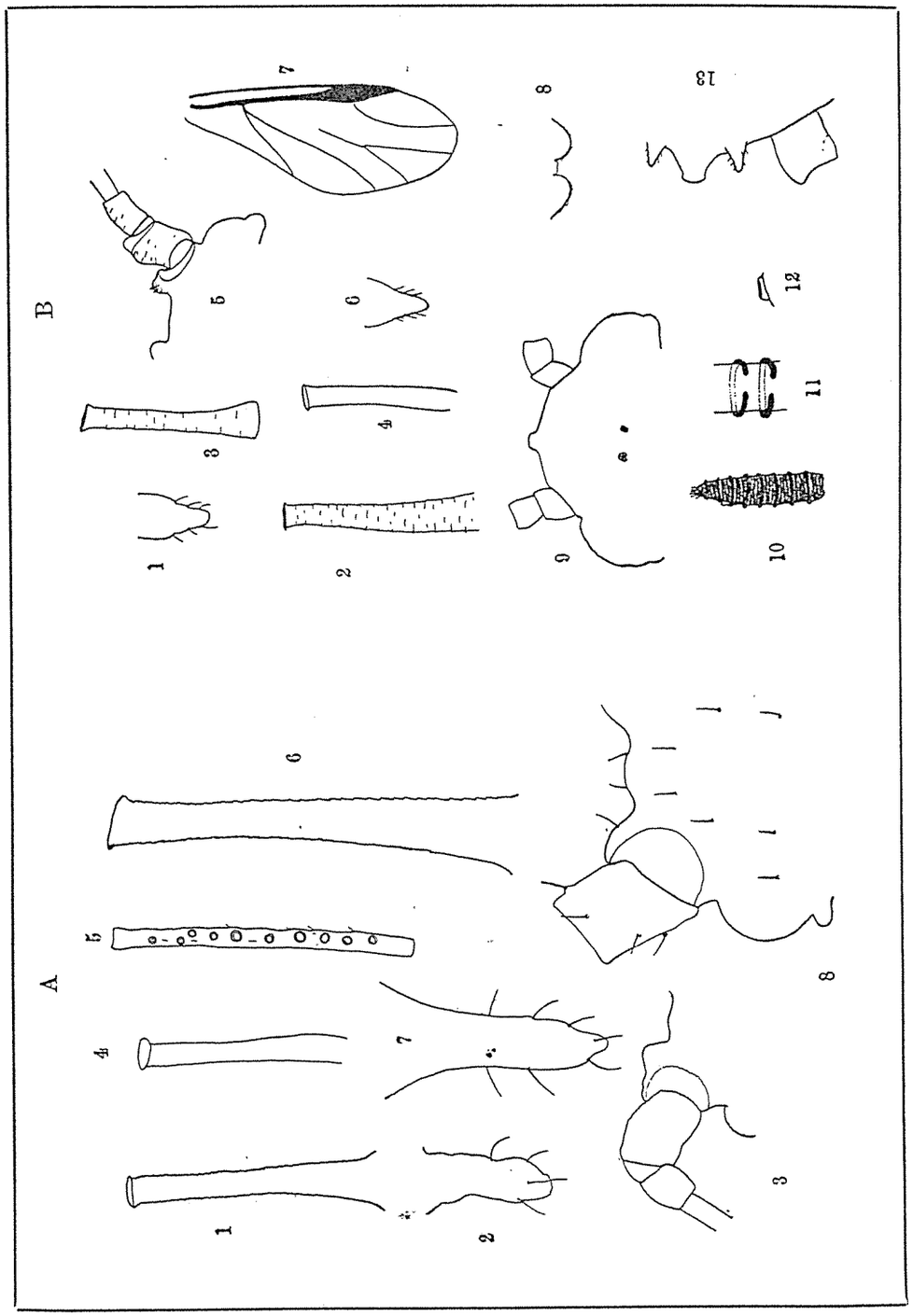


Plate VIII.

(A)

Myzus bœhmeriæ n. sp.

(Wingless viviparous female)

1——Cornicle.
2——Cauda.
3——Head.

(Winged viviparous female)

4——Cornicle.
5——3rd antennal joint.

Macrosiphum granarium Kirby.

Collected on *Miscanthus*.

(Wingless viviparous female)

6——Cornicle.
7——Cauda.
8——Head.

(B)

Myzus menthæ (Buckt)

(Wingless viviparous female)

1——Cauda.
2-3—Cornicle.

(Winged viviporous female)

4——Cornicle.
5——Head.
6——Cauda.

Astegopteryx styracophila Karsch.

(Winged viviparous female)

7——Fore wing.
8——Anal plate, hairs removed.
9——Head.
10——Last antennal joint.
11——Part of antenna.
12——Cornicle.

Oregma bamlusicola Takah.

(Winged viviparous female)

13——Head.

PLATE IX.

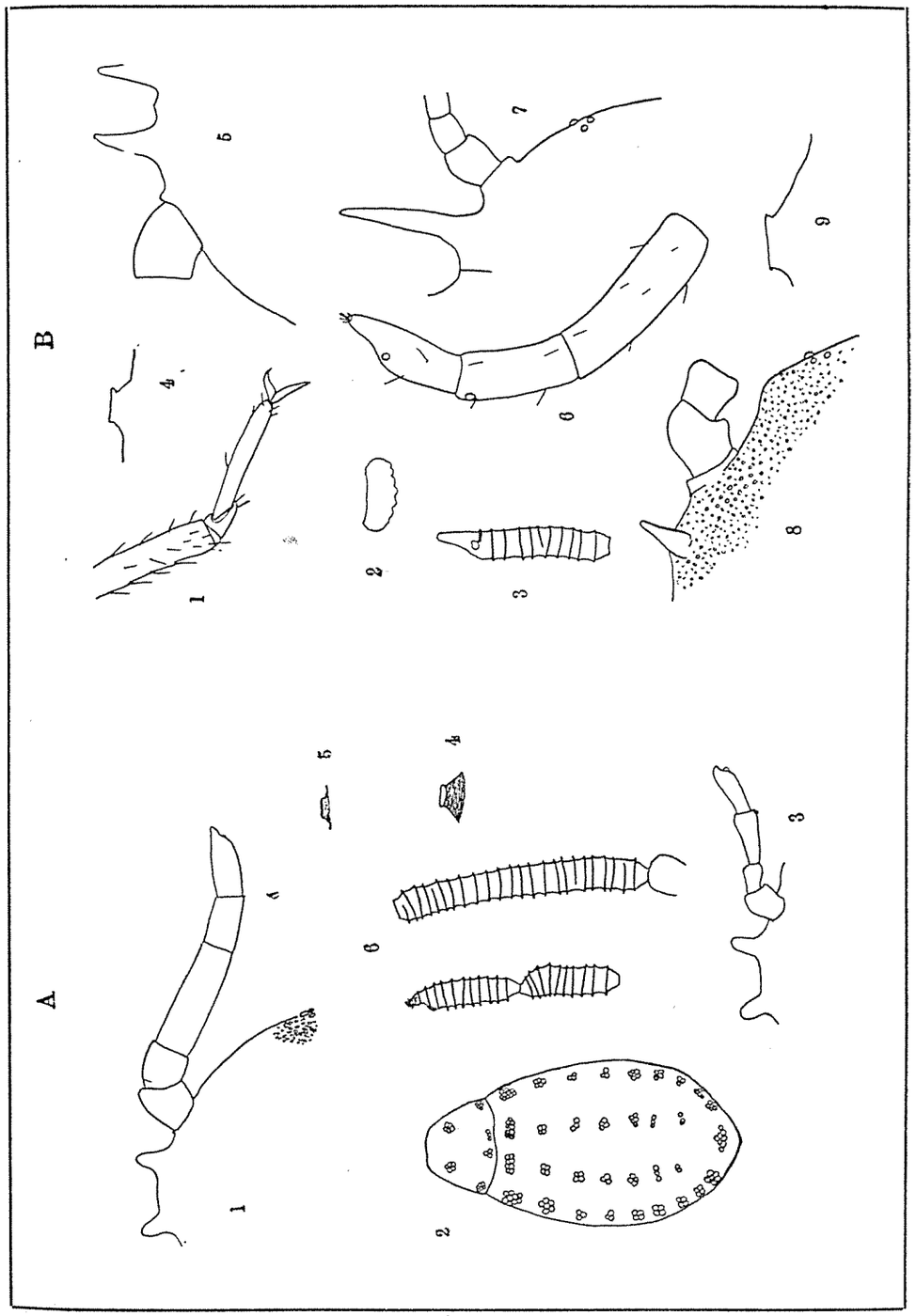


Plate IX.

(A)

Oregma panicola Takah.

1——Head of grown nymph of winged viviparous female.

(Wingless viviparous female)

2——Diagram showing the distribution of wax-pores on the dorsum.
3——Head.
4——Cornicle.

(Winged viviparous female)

5——Cornicle.
6——Antenna.

(B)

Oregma bambusicola Takah.

(Winged viviparous female)

1 ——Hind leg.
2 ——Cauda, hairs removed.
3 ——Last antennal joint.

(Full-grown nymph of winged viviparous female)

4——Cornicle.
5——Head.
6——Antenna.

(Nymph of the first instar)

7 ——Head.

(Wingless viviparous female)

8——Head.
9——Cornicle.

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